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November 1961

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### NOVEMBER 1961

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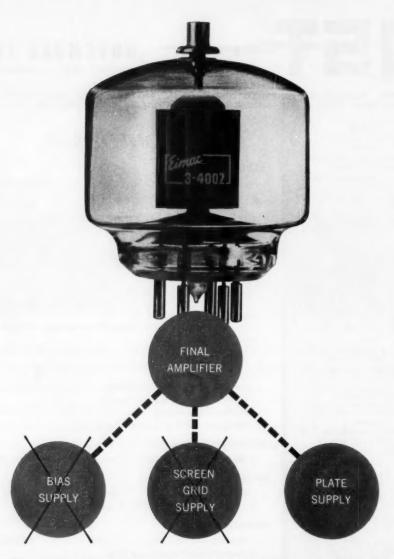
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is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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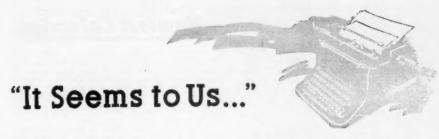
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#### OSCAR

Touch up your 2-meter receiving gear and beams for peak efficiency, gang, because it looks very much as if the 145.0-Mc. signal from OSCAR may shortly be coming our way from orbit. Nominal approval by the Government has now been obtained, through the cooperative efforts of representatives (many of them hams - naturally!) of a number of federal agencies concerned with the field of telecommunications in space. Barring unforeseen difficulty, the OSCAR package will get a "piggy-back" ride on one of the Discoverer series of U.S. Air Force satellite launchings, and we'll have (if all goes well) the didididitdidit signal available for experimentation and training and - who can say? - possibly an uncovering of some phenomena heretofore unsuspected.

In the Space Act of 1958 the U.S. Congress set forth clearly and forcefully statements of policy which emphasized that America must maintain a role of world leadership in space science and technology, and that space activities should be devoted to peaceful purposes in an aura of open cooperation with other nations. We believe that Project OSCAR symbolizes this policy. It is a worldwide effort, led by U. S. hams; it promotes the peaceful use of outer space; it encourages international cooperation; it is a tangible example of our traditional openness and of our desire to share space technology freely with other countries. The radio data received from the OSCAR satellite, if only in a modest way, could be a valuable contribution to science.

This is a project in which every amateur potentially can participate and contribute, although of course the program relies heavily on skilled and experienced v.h.f. men. Conventional satellites are tracked by a comparatively few installations of high precision capabilities. While some outstanding ham stations will be able to produce OSCAR tracking reports of comparable accuracy, the bulk of amateur intercepts will be obtained with simple gear, and their value will be reflected after reduction of the mass data.

OSCAR is ham-designed and ham-built, and meets all necessary specifications for "official" satellites such as ability to operate under space environmental conditions. It is ham all the way—it is noncommercial and non-

military (except for the USAF launch). It is our baby. Its success can raise the prestige of the amateur body; conversely, failure... but let's not contemplate that. Let's all pitch in, preferably in club groups and teams, but also individually, by participation in the program. Various *QST* articles this year have carried the essential dope on how you can help. Be ready — and keep an ear on W1AW's bulletin frequencies for announcement of the launching.

One final word, a special plea to 2-meter operators: form the habit of avoiding the 145.0-Mc. channel so you won't be unintentionally there at launch time; and when OSCAR flies, give the frequency a particularly wide berth. Thanks!

#### ROLL YOUR OWN

From time to time we receive letters giving us what-for because the Handbook fails to include certain information that would provide a basis for evaluating the alternative types of gear from which each ham must choose in setting up his station. A typical letter received recently went on to ask why nowhere could be found what is the best compromise antenna where space is limited, and how would a random wire, 20 feet above ground, compare for 40-meter DX with a 25-foot-high grounded vertical on a lawn-sprinkler-piping ground system in arid country. The same correspond-ent was also unhappy because nowhere was he told how to evaluate a receiver. Is triple conversion better than double? Are two r.f. stages better than one? On c.w. is 300-cycle bandwidth at 6 db. better than 600 cycles at the same point?

Many receiver features are matters of personal opinion and final objective, so how can they be explained in a tightly written handbook? And in the c.w.-bandwidth question there is no answer; it depends on the band, the conditions and, most of all, on the personal preference and operating skill and habits of the operator. Selectivity that is an "Open, sesame!" to some operators is much too confining to others (with built-in "cerebral filters").

But the part that shook us was the request for the "best" antenna within a tight set of conditions. We have always thought that part

(Continued on next page)

of the fun of amateur radio is trying new antennas, and keeping records in an effort to determine which antenna is the best. Each new configuration is going to be the world beater, we keep hoping, and each new arrangement of wire and insulators and tubing and supports indeed teaches us a little something. We even have delusions of devising an antenna that is a little bit better than anything in the books. Somehow it never occurs to us that an omnipotent Great White Father should punch buttons on his Univac and come up with the absolute and final answer for us. We still find it hard to understand the few amateurs who take the apparent view that the path of amateur radio leads only to a great big silver platter. QST-



#### November 1936

. The lead article was a description of a deluxe amateur station - WICCZ - which had separate phone and c.w. rigs on all bands from 3.5 to 28 Me., plus all the trimmings. . . Technical articles included discussions of heterodyne c.w. reception, the radiation characteristics of horizontal antennas, amateur use of the "magic eye" tube, rhombic antennas, automatic phone break-in, a simple two-band one-tube transmitter, and a speech amplifier.

The 7th annual Sweepstakes was announced, and for the first time it was a two week-end affair.

Correspondence from the Members indicated that interference with a.m. broadcasting by 160-meter phone operators was a big problem.

. RCA announced a new version of the 6L6 for transmitter service — the 807. . . . ARRL announced a new map of the world, complete with WAC boundaries, country prefixes, and other helpful dope.
. . . Twenty five years ago WWV was on the air three hours

QSTa day, three days a week!



Frank Stewart, W6KWT, 65 years old and totally blind, is chief operator for WA6LMT at the San Francisco Lighthouse for the Blind. Part of each day he spends making brooms at Blindcraft, and the rest he spends at ham radio. He works DX, plays chess over the air, and helps other blind people with their studies for an amateur license. He has been licensed himself for 26 years. The San Francisco Lighthouse for the Blind is located at 1097 Howard St., San Francisco, and is a private Public Service Agency, maintained by contributions.

## mfest Calen

Michigan - The annual Michigan v.h.f. conference be held at Western Michigan University, Kalamazoo, beginning at 1330 on November 18, under the sponsorship of the university's physics department. W8CVQ is the host. There will be technical talks on various phases of v.h.f. operation, plus equipment displays by several manufacturers. Supper tickets will be available for \$2.50. Contact Louis Gerbert, W8NOH, 3816 Ivy Drive, N.E., Grand Rapids 5, Mich., for further information.

New York - "Pioneer Night" is scheduled for Saturday, November 4, at the Manger Hotel, Rochester. This promises to be an unusual event for the old timer. It will start with a banquet at 1800, followed by a program of speakers, demonstrations, and a display of historical equipment, \$4.25 includes everything, although advance registration is a must prior to November 1. Mail check to Lincoln Cundall, W2QY, 69 Boulevard Parkway, Rochester 12.

Texas - The Brownfield Free Swapfest will take place on November 12 from 0700 until 1600, at the National Guard Armory. The only cost will be approximately \$1.25 for the noon meal. Free coffee and donuts to the early arrivals. Bring the whole family and all the gear you want swap. There will be meetings of various groups such as MARS, sidebanders, etc., but there will be no formal speeches. For motel reservations write to the Terry County

ARC, P. O. Box 1149, Brownfield, Texas.

Wisconsin — The fourth annual banquet of the Fond du Lac ARC will be held in Bernward Hall on Highway 175 north of Fond du Lac on November 11. Reservations must be made in advance, at \$3.50 per person, by writing to the Fond du Lac ARC, P. O. Box 243, Fond du Lac, Wis.

#### OUR COVER

Our cover this month carries typical photos from a number of the articles in this issue, to indicate the broad coverage of this and every issue of QST.

## Strays 3

K4BOO has just written in for a copy of QST to replace one he loaned to the local police department and which has now "disappeared." To quote K4BOO, "Some police force!

The XYL of K7JXG reminds us that you can have your ham call listed in the telephone directory simply by paying a small extra listing charge.

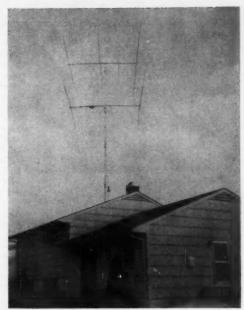
Another hammy wedding. K4PQV's daughter married K4HVO. K4ATF issued the marriage license and K4PRQ performed the ceremony.

The Oakland (Calif.) Radio Club recently held an old timers' night. W6HD was the oldest ham there - 71 years. W6IT was the first licensed ham - 1914, K6KG was the first licensed commercial - 1913.

David Richardson, W7LLV (RFD Box 81A, Eastsound, Wash.) would like to hear from any hams interested in Esperanto.

## Four Bands on a Split Level

BY JOEL HURWITZ,\* W3YZI



"The XYL just fainted. . . ."

If you would like to mount 20- and 40-meter beams on your roof, this shows one way of doing it. If you run into opposition, you can still make use of some of the excellent mechanical ideas described here in a less ambitious installation.

#### Telescoping Mast for Dual Beam Antennas

Last winter, 20 meters went out very early in the evening, while 10 and 15 were virtually hopeless at that hour. Since most of my operating has to be done after the kids have hit the sack, my thoughts turned to 40 meters — more specifically to a Hy-Gain 2-element beam as a back-up for the tribander. I must confess that I ordered the 40-meter job without much thought about how I was going to put it up. As a result, it rode out one of the worst winters in history lying in its carton while the details were worked out.

The problems that I had to overcome were many, not the least of which was the decision handed down by the XYL against a tower in the back yard. This restriction had been circumvented in the case of the tribander by installing a 26-foot aluminum-pipe mast through a weather-proof hole in the roof of the house at the time it was built. This mast consisted of single lengths of 4-inch,  $3\frac{1}{2}$ -inch and 3-inch standard pipe which telescope perfectly. The base was bolted securely to attic timbers, and the top was steadied

with guys fastened to anchorages at the roof corners. A C-D Ham-M rotator, carrying the tribander on its shaft, was mounted at the top of the mast.

#### Adding 40 Meters

Since there wasn't enough roof area to swing the two beams if mounted on separate masts, the project boiled down to one of mounting both arrays on the same mast. My first thought was to stack the two on a 10- or 12-foot extension mounted on the rotator. This idea was rejected however, when I began to consider the stresses that would be imposed on the rotator shaft and mounting in a high wind. There was also the question of how to get the two-band assembly on top of the mast without the aid of a crane.

Both of these major problems were eventually solved by the telescoping arrangement shown in Fig. 1. The mast can be collapsed to bring the lower of the two antennas (the 40-meter one in this case) down to the level of the first mast section — about 3 feet above the ridge of the roof. The complete mast, with the exception of the base section, rotates in a base bearing which

<sup>\*</sup>The Hurwitz Electrical Co., 1011 Hillen St., Baltimore 2. Md.

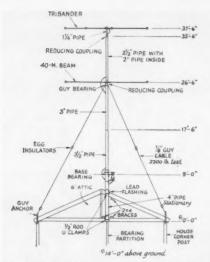


Fig. 1—This sketch shows the over-all makeup of the mast and its mounting. Sections are lengths of aluminum pipe in the sizes indicated.

relieves the rotator of all weight. The total length of the mast is  $37\frac{1}{2}$  feet, bringing the tribander  $51\frac{1}{2}$  feet above ground level.

The design details are shown in the sketches and photos. The various stresses and loads were checked by my good friend Irv Kind, K3DCP, who is a civil engineer when not hamming, and he made several recommendations as to materials and dimensions. He estimated that the structure, as shown, carrying the two beams, should be good

for winds up to 90 m.p.h. At the prospect of hurricane winds above this velocity, the mast can be collapsed to a safe height. The president of a local machine shop was using the back end of my garage to refinish the top of his boat, so I knew where I could get the few machined parts that I needed. (He also possessed a well-stocked junk box.)

#### Mast Design

The base section is a 9-foot length of 4-inch aluminum pipe. This section is mounted as shown in Fig. 2. It protrudes through a waterproof hole in the roof. Be sure that it is plumb.

The second section is a 9½-foot length of 3½-inch pipe. This telescopes nicely into the 4-inch pipe with a clearance of 0.013 inch. After inserting the smaller pipe 12 inches into the larger, a collar consisting of a 4-inch length of 4-inch galvanized steel pipe is bolted to the 3½-inch pipe as shown in Fig. 3, thus forming a simple sleeve bearing.

The third section of the mast is a 10-foot length of 3-inch aluminum pipe. This telescopes 12 inches into the 3½-inch pipe with a clearance of 0.024 inch.

The top section, which is unguyed, is stiffened by inserting a 10-foot length of 2-inch pipe inside a similar length of 2½-inch pipe. The clearance between the 3-inch and 2½-inch pipes is almost 0.1 inch, which is much too great to be tolerated. Therefore, the top end of the third section is threaded to take a 3-to-2½-inch reducing coupling, as shown in Fig. 4. The threads at the

<sup>1</sup> Standard aluminum pipe or conduit in 10-foot lengths, threaded at both ends and including one coupling, may be obtained from electrical-contractor supply houses, such as Graybar, Westinghouse or General Electric.

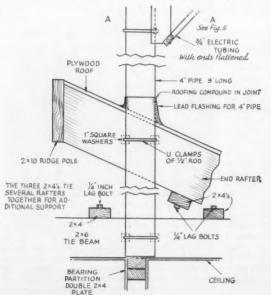


Fig. 2—Details of the base-section mounting. Points A—A match up with similarlylettered points of Fig. 5.

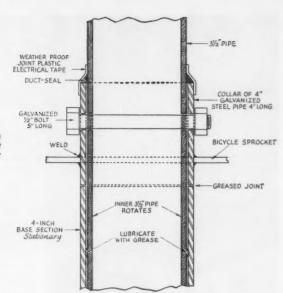


Fig. 3—Details of the sleeve bearing at top of base section. The driving sprocket is welded to the galvanized iron collar which mates with the 4-inch base section to form a bearing.

smaller end of the coupling are reamed out so that the  $2\frac{1}{2}$ -inch pipe will go through with a sliding fit. The bottom end of the  $2\frac{1}{2}$ -inch pipe is threaded to take a straight coupling turned down to make a sliding fit inside the 3-inch pipe.

A guy bearing is placed at the top end of the third section. This consists of a 6-inch-square plate of ¼-inch aluminum, bearing against the reducing coupling. The plate has a hole reamed out to 2.9 inches at the center to fit the 2½-inch pipe, and a ½-inch hole in each corner to take a guy-wire thimble. A metal skirt immediately above the bearing plate, as shown in Fig. 4, protects the bearing from rain and snow. The 40-meter boom is fastened to the mast just above the rain skirt, also as indicated in Fig. 4.

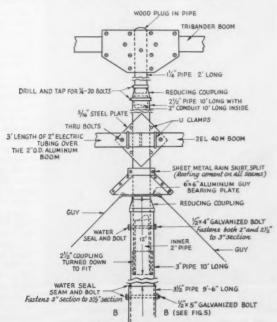
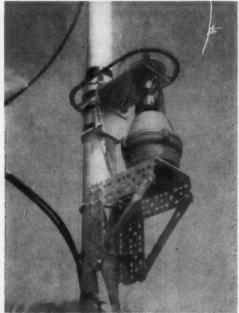


Fig. 4—Details of upper sections of the mast, showing the mounting of the two arrays. Points B – B match up with similarly-designated points in Fig. 5.



Guy wires are anchored to outside rafters and corner posts of the house. Notice that the turnbuckle is bridged with a safety wire.



The rotating mechanism and its mounting. U bolts are used to clamp the mounting to the mast. This view shows how the feed lines are looped around the bearing, and one of the waterproof tapings used at all section joints except the one at the guy bearing.

The top end of the last mast section is fitted with a 2½-to-1¼-inch reducing coupling into which is threaded a 2-foot length of 1½-inch pipe. The boom of the tribander is mounted on this short stub.

Aluminum pipe is virtually essential, since steel weighs about three times as much and would be practically impossible to handle in the manner described. It would also add significantly to the load on the bearing and rotator. The bolt holes at the mast joints should be given an identifying mark at the time they are drilled. It is very difficult to drill these holes so that they will match exactly except as drilled.

#### Rotator Mounting

The sketch of Fig. 5 and one of the photos show how the rotator is mounted on a shelf attached to the stationary base section. The shaft of the rotator is fitted with a bicycle sprocket, and a similar sprocket is reamed out and welded to the 4-inch collar at the base of the second mast section. The two sprockets are joined with bicycle chain. Thus the rotator carries no weight and is subject to only torque stresses.

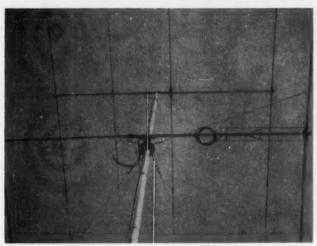
#### Raising the Mast

This project of putting the mast up is one that should be reserved for a calm day. (K3DNU, W3IMA and I tried to do the job in a 25 m.p.h. wind, and we'll never be quite the same again!)

It will be noted that each mast section is a little longer than the one preceding it. This allows the top end of each section to protrude above the preceding one when the mast is telescoped so that it may be

grasped to raise it. When raising (or lowering) the mast, a gin pole (a 14-foot ladder in my case) and a small block and falls will be needed. The setup is shown in Fig. 6. A short loop of rope, such as shown in the detail, can be used for grasping the mast section. The release cord is of twine. A similar double strand of twine over the hook of the falls will help to disengage the hook from the loop and bring the hook block back down if the latter does not have enough weight to fall of its own accord. A yank on the other release cord will free the seizing loop from the mast. As for manual assistance, you will need two men to heave-ho on the line, a third ready to secure the line after the mast section has been raised, and a boy to insert the intersection bolt after the holes have been lined up.

The raising process starts with all sections telescoped. When telescoping the sections, try to keep the intersectional bolt holes oriented according to the identifying marks, since it may be difficult to twist a section very far to line up the holes after it



Ten through 20 over 40. The chief point of interest here is the rain-shielded guy bearing plate.

has been raised. Before inserting the 3½-inch section, apply a liberal coating of lubricant, such as water-pump grease, to the bottom 12 inches. Before dropping the third section into the second, slip the collar carrying the sprocket over the 3½-inch pipe. Also, before dropping the top section into the preceding one, be sure to slip the guy bearing plate over the bottom end of the top section and apply lubricant to the bottom side of the plate.

Make an estimate of the length of each guy and attach the guys to the bearing plate. Raise the mast first without the beams attached, and fasten the guy wires to their anchorages with approximately normal (fairly loose) tension Without the load of the antennas, the mast can be raised by hand. Also, it is not necessary to extend the top section at this time.

Now lower the mast. Fasten the upper beam (the tribander in this case), with coax feed line attached, to the stub on the top section. Using the gin pole, raise the 2½-inch ection and bolt to the 3-inch pipe. As the section is raised, tape the feed line to the mast section at intervals. Attach the rain skirt immediately above the bearing plate and then mount the lower beam. Make sure that the two antennas have the same orientation. Bring both feed lines down over the rain skirt and bearing plate in the form of a wide loop that will allow 180-degree rotation without interference from guy wires.

Now raise the 3-inch section and bolt it to the  $3\frac{1}{2}$ -inch section. Raise the  $3\frac{1}{2}$ -inch section, twist the sprocket collar around so that the holes line up, and fasten with the bolt. Both feed lines should be taped to the mast at intervals as these last two sections are being raised, and the lines should be formed into loops around the bearing and sprocket as they were at the guy bearing.

At this point, slight readjustment of the guy wires may be required to line up the mast so that there is a minimum of binding at the sleeve bearing. Check the mast for plumbness with a 36-inch level or an engineer's transit. Too much tension on the guys will put unnecessary pressure on the bearing, causing it to bind. On the other hand, too little tension will allow the mast to bend, again increasing the friction at the bearing.

The rotator mounting brackets are fitted with slotted holes to permit accurate adjustment of the alignment of the two sprockets and the tension of the chain. The chain should be tight. Otherwise there is danger that it will jump off the

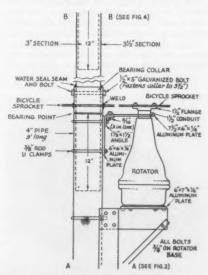


Fig. 5—This sketch shows the mounting of the rotator.

Points A – A and B – B match up with similarly-designated points in Figs. 2 and 4.

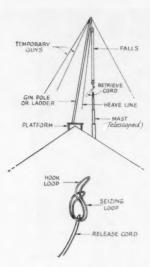


Fig. 6—Suggested method of raising the mast. Guyed gin pole and falls are used to raise the telescoping mast sections, one at a time, starting with the top section.

sprockets when the mast is turned, or in a high wind

You are now all set to run the feed lines to the rig and give it a whirl. Of course, your wife, friends and neighbors are not speaking to you at this point, but you are on the air!

I would like to extend thanks to the Dorman Electrical Supply Co. for the pipe and miscellaneous electrical supplies, the Westendorf Mfg. Co. for the machine work and access to their junk box, Irv Kind (K3DCP) for the structural calculations, Len Muskin (K3DNU) and John Selis (W3IMA) for their strong backs and weak minds, Lloyd Briggs for his extra strong back, Lou Taich (W3IKX) for the use of his camera and last, but not least, my XYL Elaine, who didn't bat a pretty eyelash when she unexpectedly saw the thing on our roof—she just fainted!

## New Apparatus

#### Seco Model 511-A Attenu-Load

The device shown in the photograph can be Iused as a 50-ohm shielded dummy load or as a 10-to-1 power reducer. Manufactured by Seco Electronics, Inc., Minneapolis 19, Minn., the unit consists of several banks of composition resistors, a slide switch, and two SO-239 connectors all mounted in an aluminum box which measures about 3 inches on each side. With the slide switch thrown to the internal position, the unit becomes a 50-ohm dummy load with a power dissipation rating of 50 watts. The following table shows the impedance of the load at various amateur frequencies, as measured in the ARRL lab:

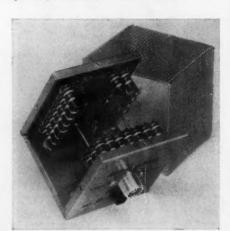


	Table I	
Frequency	Input Resistance	Equivalent Shunt
(Mc.)	(ohms)	Capacitance (µµf.)*
4	51.0	14.3
7	51.0	14.0
14	50.5	13.0
21	50.	12.4
29	49.5	12.0
50	47.5	10.7
145	35.0	6.6

\* Shunt capacitance required to be subtracted to resonate the circuit at the given frequency.

With the switch in the external position, the circuit is changed to a 10-db. T pad, which reduces the power by a ratio of 10 to 1. A second SO-239 connector at the rear of the box (not visible in the photograph) connects the reduced power to an external load which could be, for example, a low-drive amplifier or a test instrument. The Attenu-Load can be mounted in any position, but the metal case has four rubber feet en one side for mounting convenience.

#### - E. L. C.

## Strays 3

Units of Naval Security Groups (specialized naval communications) will hold open houses at the Whitestone (Queens), N. Y., armory on Wednesday, November 8, and at the New Rochelle armory on Thursday, Nov. 9. Equipment displays, movies on operating and technical matters, recruiting talks, and refreshments. For further information call Flushing 9-4064 or NEw Rochelle 2-7478.

### **Sweepstakes Comes First**

BY JOHN G. TROSTER,\* W6ISQ

Now, Marge, I distinctly remember telling you that this next week end was out! Sweepstakes only comes once a year.

"But, John, Unele Osky said he would give us the plane tickets free - just to go along to keep

him company!"

"Well, I'm sorry, but Acapulco doesn't qualify for any points in the Sweepstakes. Maybe I could suggest to the League that they make "XE" into section 73 - I wonder -. No, anyway Marge it's probably hot and humid there and nothing to do but sit around the pool and watch gir - ahhhh, drin - ahhhh, nothing to do but watch - no, probably too many sharks. Sweepstakes comes first.'

"Well, I already told Uncle Osky we could go. You told me the date of the Sweepstakes last July and I put it on the calendar. See, circled in red. You said you were planning ahead like it said in

the article.1

"Marge, would I make a mistake on a date like that? It's like your birthday, Christmas, our wedding anniversary, July Fourth - things like that. If Uncle Osky really wants us to go, he'll have to move it up a week or so. Maybe I could rest up for SS - ha. Anyway, how do you think I could get away from the office?'

"That's unimportant! You would just have to leave, that's all. Besides the children will be very

disappointed."

"Don't make it sound so horrible, Marge like I'm a monster or something. Sweepstakes is the only contest I really work at - kind of a tradition. In the DX contest I only spend 60 or 70 hours - I've never used the whole time vet! Same with the CD cor 'ests and v.h.f. tests. Never spend over 18 hours - and in W/VE and VK/ZL I only spend Saturday night and Sunday afternoon. So don't exaggerate or be unfair, Marge. Besides, you said you liked doing the yard work.'

"But I just hate to tell Uncle Osky we can't go because of a radio contest, John. He'd never understand. Think you were on a quiz program or something - and you know what he thinks

about those!"

"Well, tell him something. Business engagement or something - I have an appointment Saturday evening - can't break it. And the kids will get over it. Take 'em to see the "Two-Headed Teenage Monster Meets Snow White". Good family-type show - togetherness. Kids would love it! Ha."

"Don't be vulgar, John. I wouldn't even let you go to see that odious thing. What kind of depraved people would go to a thing like that anyway -- ???"

"OK, Marge, don't get mad. But tell the old gent something - and be nice too - remember



your inheritance, ha! "John, really!

"It's all worked out beautifully, John. Uncle Osky understood. He knew all about those contests. Said he used to win all the spelling bees. Since you are busy, he wants me and the kids to meet him at his rancho in Palm Springs - the one that backs up the second green. You know, the one with the olympic-sized pool. So we'll go down there and spend the week end."

"Suppose they are all swimming around Uncle Osky's pool. Now to lock the doors and have a real week end - the first of such idyllic trysts devoted exclusively to the pursuit and happiness associated with Sweepstakes - da de da

"Five to go. Snap off the rig, move the coffee pot in here. Full pot ought to take me through about 1800 zebra. Ha! TV dinners - snacks where's the cheese - OK, everything set."

"Tune up the old Scandahoovian Pulverizer on 20 - all 100 terrifying watts ready to tear the ether atom from atom! Swing beam east. Drop of oil on the bug. Drop of coffee for the OT. Ready for the count down - and here we go -"

"5-4-3-2-1 Go! Cqcqcqcqcq de W6ISQ k."

"W6ISQ de W9BRD k."

"Ha, ha. Boy, am I hot - first one! W9BRD de W6ISQ. Nr 1 W6ISQ 589x SCV 1500 date k." "W6ISQ de W9BRD. R Nr 449 W9BRD 579x

Ill 1700 date k.'

"- Nr. 449?? My gosh, he's kidding or sumpin. Rod's a good operator but 449 already! He's trying to demoralize the opposition - that's it. W9BRD de W6ISQ r 73. QRZ de W6ISQ." "W6ISQ de W6YHM k.

"Ahhhh - old buddy YHM de W6ISQ. Hi, Don. Nr. 2 W6ISQ 599x SCV 1501 date k,

"W6ISQ de W6YHM. R es sri missed you first half SS last week. Hr Nr 507 W6YHM 599 — 73."

"Good evening, Bijou theater."

"Miss, when is the next showing of the "Two-Headed Teenage Monster Meets — ."

<sup>\*45</sup> Laurel Street, Atherton, California.

1 Troster, "Planning Ahead," QST, Nov. 1960, p. 56.

## Single-Switch RTTY Control

Simple System for Transmit/Receive/Print

BY JAMES H. FLYNN, JR., W4ISM/A4ISM, Ex-W2BDJ

This article describes the use of a single switch, normally on the transmitter and functionally labeled TRANSMIT-STAND-BY, to permit the following RTTY operations:

1) While in the STAND-BY position, the selector magnets on the teleprinter are in series with a 60-ma. (or other value, depending upon the requirements of the magnets) supply and the TU (converter) output for routine receiving operations.

2) When in the TRANSMIT position, the printer keyboard pulses a relay that has one set of contacts in series with a 60-ma. loop containing the selector magnets, thus providing local copy of transmissions. The other set of contacts pulses the f.s.k. circuit.

 Also, by the installation of an additional switch, the machine can be used as a station typewriter.

One sure-fire method of checking the frequency shift and quality of one's own RTTY transmissions is to copy your signal through the receiver and TU to provide local copy. This method, while satisfactory if you are transmitting and sending on the same frequency, cannot be accomplished if you are a kilocycle or more off frequency. This point was brought home during the recent Armed Forces Day RTTY contest when some RTTYers in the amateur bands attempted to establish contacts with military stations on various frequencies outside the amateur bands. If the station lash-up consisted of a scheme to make local copy by picking up the transmitted signal in the receiver, it was tough sledding - if you remained on the military frequency, you could not monitor your sending.

ZS1FD, in his "Case History of RTTY in Foreign Lands" (RTTY, May, 1961), laid it on the line by saying, I "just could not figure out why so many fellows insisted on making local copy by their own signal in the receiver." Of course, the reason for this is a desire to maintain monitoring, via the TU, the frequency shift of the transmitted signal and exactly what you may expect the receiving station to be printing. This inflexible control seems unnecessary. Normally

the usual 850-cycle shift is set and seldom needs resetting.

Before describing the rather simple circuit of Fig. 2, it must be assumed that the RTTY station has at least a t.r. switch that is capable of performing antenna switching, receiver muting, and other normal functions. This being the case, we have the ability to either add a relay to the t.r. switch circuit, or add a couple more poles to the relay that you may be using to duplicate the functions of  $K_2$ . However, this gets ahead of the story.

In RTTY, keep in mind that the teleprinter is basically a simple electrical apparatus consisting of a pair of selector magnets and a glorified switch called a keyboard. Add a 115-volt a.c. line for the motor, and that's it - ignore all the rest of the wires and you'll agree that the printer is a simple electrical device. Now, getting down to business, in the receiving position the keyboard is not in the circuit. Most of us get the selector magnets to pulse from a polar relay in the TU in series with a 60-ma, current supply, as shown in Fig. 1. If you desire to send and copy what you send without using the station's TU, it's a cinch that you need the selector magnets, current to pulse them, and pulses from the keyboard to take the place of the polar relay. In addition, don't forget the most important function of keying the f.s.k. circuit.

Now refer to Fig. 2, which is shown in the STAND-BY position. Studying this, we see that the circuit of Fig. 1 is still intact. Let's go to TRANS-BY and follow this:  $K_2$  breaks one leg of the polar relay that was in the receive circuit and, at the same time, closes the keyboard circuit. This activates relay  $K_1$  and, with the keyboard in its "rest" position, the f.s.k. is pulsed in the "mark" position and the selector-magnet circuit is closed, waiting for the keyboard to be hit. When a key is depressed,  $K_1$  pulses the selector magnet for local copy and pulses the f.s.k. for transmitting—regardless of the station receiver and the station's TU.

By closing  $S_1$  while in the RECEIVE position, the teleprinter can be used as a local (off the air) typewriter, a practice we all follow. The author also uses this switch when receiving in upper case by merely closing the switch and pressing the LTRS button on the keyboard and then opening the switch. This brings the machine down to lower case for correct printing. When using the machine as a typewriter, you may have to pull the plug from the polar relay temporarily if the polar relay contacts are touching the armature.

Any of a variety of relays could perform the

\* 1112 Drewlaine Drive, Vienna, Virginia.

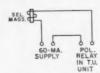


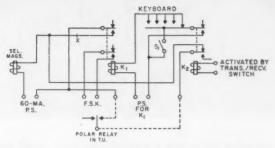
Fig. 1-Basic RTTY selector magnet circuit.

Fig. 2—Circuit of the control system.

K<sub>1</sub>—Fast-respond d.p.d.t. d.c. relay, 120 volts, d.c., 2500 ohms (Clare C-27998).

K<sub>2</sub>—D.p.d.t. a.c. relay (Advance

MG2C115VA or similar). S<sub>1</sub>—Toggle or other s.p.s.t. switch.



functions of  $K_1$  and  $K_2$ . Those I use are listed under Fig. 2. A whole lot will depend upon what is available to the builder, but anyone in the RTTY business who has fought the battle of the polar relay should have no trouble with simple relays. However, it must be noted that  $K_1$  should be a fast-keying relay, capable of reacting to the 22-ms. pulses.

For RTTYers who have TUs that do not use a polar relay, do not despair. In this type of arrangement, the selector magnets are fed directly from the output of amplifier tube(s). The circuit in Fig. 2 can be adapted to this arrangement. If you want local copy without use of the station receiver and TU, you will need a 60-ma. supply (you can't get something for nothing here). Break the line at X, insert the 60-ma. supply at this point, short the 60-ma.terminals shown in Fig. 2, and you'll have local copy as

described above. (In this case, disregard the polar relay and the location of the 60-ma. supply as originally noted in Fig. 2.)

One more point, and we'll let you go. The author uses this circuit primarily on MARS frequencies where the c.w. identification requirement doesn't exist. However, when using RTTY in the amateur bands, a single-pole single-throw, spring-loaded, normally closed switch should be inserted across the standard telegraph key. When identifying on c.w., merely open the springloaded switch, identify with the key, using the other hand and, when the hand holding the spring-loaded switch is released, the printer is ready to send. Some amateurs use the SEND REC BK switch on the printer for this function, but this unnecessarily complicates the wiring of the machine, and we previously agreed that it should be a very simple device.

#### NEW BOOKS

Eliminating Man-Made Interference, by Jack Darr. Cat. No. MMD-1. Published by Howard W. Sams Co., Inc., 1720 East 38th St., Indianapolis 6, Indiana. 160 pages, 5½ by 8½ inches, paper cover. Price, \$2.95.

Divided into twelve chapters, this manual covers just about the entire field of man-made interference; what it is, how it is transmitted, how it originates, how to track it down, how to eliminate or minimize its effect on TV, audio amplifiers, auto, aircraft and marine radios. There are several case histories of out-of-the-ordinary noise and interference, as well as cases of typical interference from the files of the FCC. There are many illustrations showing how different types of interference appear on TV screens, Other illustrations show how to build noise filters and interference suppression devices. Especially of interest to radio amateurs should be the chapter on automobile interference.

Radio Transmitters, by Laurence F. Gray and Richard Graham. Published by McGraw-Hill Book Company, Inc., 330 West 42nd St., New York 36, N. Y. 462 pages, including index, 6½ by 9½ inches, cloth cover. Price, \$12.50.

This manual includes analysis of all the major components that go to make up a transmitter. Design information on amplifiers, coupling circuits, frequency control units, power supplies, cooling equipment, and control circuits, methods of modulation and keying, and typical testing and measurement techniques are covered. The book also goes into basic principles of transmitter circuits, frequency control techniques, operation and methods of designing amplifiers, transmitting tubes, antenna coupling circuits, methods of amplitude modulation, e.s.b. circuits, frequency, phase and pulse modulation, power supply design, including filters and automatic regulators, and protective and control circuits. There is also information on directional couplers, power dividers, diplexers, synthesizers and microwave components. The treatment of the material, although practical in nature, is sufficiently theoretical and includes plenty of bibliographical material. The subject matter is arranged so that almost anyone with a basic understanding of electronics and physics will be able to follow the discussions and use the design information.

How To Locate and Eliminate Radio & TV Interference, by Fred D. Rowe. Second edition. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 160 pages, including index, 5½ by 8½ inches. Cat. No. 158. Paper cover. Price, \$2.90.

The second edition of this manual has been brought up-to-date and includes the newest FCC rules and regulations concerning interference. The latest detection techniques are described, as new and improved electronic components for eliminating interference. Although concerned primarily with TV and b.c. radio interference, the techniques can be applied to amateur interference problems too. Especially interesting to radio amateurs will be the chapters on power line interference, fluorescent and filament lampinterference, and television interference suppression of transmitters. Included in the manual is a section of questions and answers on the subject of interference and another covering FCC rules and regulations.



PLASHING across the newspapers, blaring over the radio, and being viewed on TV, news of Field Day 1961 told of amateur radio activity in hill and dale. Eye-catching headlines like "Hams Really Cooking on Field Day," "Field Day Big Success," "Area Radiomen Participate." "Three Stations Beam to World," provided hams the golden opportunity to show our wares to the community and acquaint the public with our abilities in providing emergency communication. Field Day's 3000-plus transmitter-receiver setups in the field on emergency power and 13,000 people to provide that communication testify to our capabilities. This year our hobby really proved its worth in the community's eye as evidenced by the excellent publicity Field Day activities generated. It is important that amateur radio efforts be so recognized by the community.

Of course, Field Day publicity just doesn't "happen." You've got to make the effort yourself to get your FD operations publicized. What group doesn't thrill in seeing their operations written up in the local "Bugle?" In familiarizing John Q. Public with Field Day and ham radio, the Jones County Amateur Radio Club, W5FDQ/5 related: "Our club publicity before Field Day included over 150 radio spots, tape recorded by members of the club and run on three local radio stations. We had several stories in the local daily. We also appeared on a 15-minute TV show in connection with Amateur Radio Week. The entire show was devoted to a discussion of ham radio and a display and explanation of a typical ham station, including a mock demonstration of passing emergency traffic. Our mayor (Laurel, Miss.) proclaimed the week of June 18-25 as Amateur Radio Week and Sunday, June 25, as Amateur Radio Day, encouraging the public to observe this day by visiting the Field Day site. The local police force brought their emergency truck to the FD site to demonstrate to our visitors.

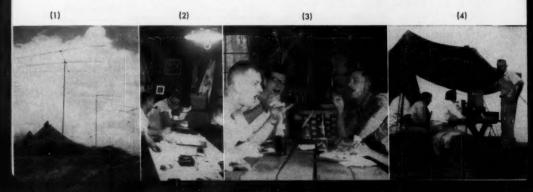
#### \* Ass't Communications Manager, C.W., ARRL,

#### BY JOHN F. LINDHOLM.\* WIDGL

It was the first time the chief had ever observed ham radio in operation. In spite of the heavy rain, we had over 200 visitors to our FD site."

To promote good public relations, ARRL distributed press releases to 1200 affiliated clubs and more than 650 newspapers. The Helix Amateur Radio Club, W6MGJ/6, put this to good use: "We used the sample publicity sheet which ARRL sent us, and we were able to get good news coverage both by press and TV. Many of us were able to see ourselves on TV after Field Day was over, during the weekly news résumé." And the Ogdensburg Amateur Radio Club, WA2FKK/2, reported good results: "We had about 200 visitors with most comments on the beer-can vertical. With the large number of





visitors and excellent publicity, this was an outstanding public relations event in this area. Seven different articles appeared in four newspapers, and six items on radio and one on TV."

#### Participation

We have a lot to crow about. Marking a healthy steady increase in reported activity, 13,750 people sojourned into the field to participate; this reveals a 1.6% increase over last year's previous record figure . . . and it's anyone's guess how many didn't send in their results to ARRL. Measuring it rig-wise, there were 3184 separate receiver-transmitter setups reported, while just three short years ago, there were 500 less than this. Field Day is by far the biggest, and judging from the activity, the "bestest" amateur radio activity in the world. No other operating activity even comes close to comparing with Field Day. Field Day is tops with everyone.

#### Conditions

Radio conditions proved good in almost all areas and generally speaking, seemed to be very much on a par with last year, only slightly poorer in some sections. Two days before Field Day, the W1AW Propagation Forecast Bulletin of June 22 announced that "the present unstable conditions are expected to continue through tomorrow, with quality good on June 24–25, and depressed again the following few days." Wow, good conditions just for FD! Eighty and 20-meters were hot for many QSOs all the way through, with 40-meters squeezing in the most

signals in the smallest slot of spectrum . . . like QRM galore. It depended where you were on how well you did on 10 and 15; most found it dead, while others scored slews of contacts here. V.h.f. hadn't fully recovered from the greatest 6-meter opening ever during the V.H.F. Party two weeks earlier. With a slight opening Sunday afternoon, coupled with loads of local activity, scores were to be had here, too.

#### Weather

Since FD setups are pretty much at the mercy of the elements, the weatherman is looked to with anticipation and hope prior to Field Day. This year he wasn't much consolation, though, as weather conditions were generally spotty with scattered thundershowers reported throughout most of the country. It varied as much as there being 24 hours of rain in Dallas but pleasant sunshine in Houston. Texas is mighty big though! Many groups had to take extra precaution at their high eagle-nest locations in the face of danger from lightning. Citing the electrical storm hazards, the Lehigh Valley Amateur Radio Club, W3OI/3, penned: "We had good operating positions but lost one 300-foot long-wire to lightning, a close one for six of our members." The Thornton Schools Radio Club, K9PFN/9, concurred with: "Surprise thunderstorms, 35 m.p.h. winds, and a blown final whittled down our score." Fortunate were the few areas, mostly in the West, that dodged any shower activity. A saturated Saturday and a sunny Sunday seemed to be the order of the week end.

(1) Here's a beam farm for you. The 40-meter job was well worth the pains of erection, so says the crew at K4GSD/4. (2) Two operators at W5SA/5. (3) Left to right, W4HNW, W4NOW, and K4IVI's dad refuel on steaks prepared by the latter to keep the ops in top operating shape at K4IVI/4, North Augusta-Belvedere Radio Club. (4) Six and 2-meter station at South Peninsula Amateur Radio Klub, W6WC/6. (5) W4YMG (left) and K4BOM (right) at Mid-South Amateur Radio Assn., W4EM/4. (6) Finishing touches on the beam installation at the Prarie Amateur Radio Club, W9GFD/9. (7) W9SNJ holds down the 20-meter position for the Fort Wayne Radio Club, W9RJY/9. (8) Here's the faithful genny for VE4HE/4, Winnepeg Amateur Radio Club. (9) The convenient operating bus of K9UTI/9.





Here and There

However, wherever there are determined hams together, nothing but nothing will halt Field Day. Of the club entries, the two-transmitter class was the most popular with 251 entries and the one- and three-transmitter setups even at 216 entries each. Number of entries descend from there with increased number of transmitters. W3RCN/3, the Rock Creek Amateur Radio Assn., accumulated the most gear with 12 rigs scoring simultaneously . . . and also high in people participating with 110 scurrying about. My, what a hectic week end! ARRL log checkers found three out of four hams can't spell peninsula (or is it perninsaler?), while a goodly number didn't bother to put down their club name - these people being saved by patience and the trusty Call Book. And what hams don't know about message handling would fill two Operating an Amateur Radio Station booklets. That's minus ten points on the score, you know! Also on the negative side, several entries came in considerably past the deadline. Without a reasonable excuse, they just missed out on the score listing. To report the results earlier, we must have the logs per the rules.

#### VEs

Statistically, the Canadian picture is an interesting one, with VE activity simply soaring skyward this year. Numerically speaking, Canadians account for only about 4% of the total W/VE ham population, yet the VE Class A entries account for 7.5% of the total . . meaning that in proportion to the number of Canadian to U. S. amateurs, Canadians had nearly 100% more



"Why don't you shave?" is a familiar expression of razor blade salesman, but KØTBE (left) is obviously too engrossed in scoring more contacts for the Pikes Peak Radio Assn., KØTBE/Ø, to worry about such details. Logging (right) is W4EKD.

participation or did twice as well as U. S. hams. If the W/K entries equaled the Canadian participation, we'd have roughly twice as many logs to score! Think of that a minute, will you? Congratulations to the VEs for an outstanding performance. Speaking of VEs, quite a battle for top score in VE1-Land ensued with VE1FO/1. VE1JV/1, and VE1PF/1 scoring 3564, 3546, and 3537 respectively. VE3DOH/3, the Windsor Amateur Radio Club, led the eight transmitter category, while the Scarboro Amateur Radio Club, sporting a new abbreviated call, VE3WE/3, wrested top-VE laurels from the Nortown Amateur Radio Club, VE3NAR—both groups in the 10-transmitter class.

#### Top Scores

The contest aspect of Field Day pushes us forward scoreward. The Valley Amateur Radio Club, W7HZ/7, enjoying good weather and propagation conditions, fell shy of their record 1960 mark by but 50 contacts and a few hundred points, to outscore all others again this year with 30,357 points. The 11-transmitter class ended in a virtual dead heat between W7DK/7, Radio Club of Tacoma, and the Tri-County Radio Assn., W2LI/2, with ten QSOs separating these second and third highest scorers. Of course, you're competing against clubs of like number of transmitters in operation, and these groups were tops in that department:

Class	Call	Club Name	Score
1A	K5SGX/5	Lafayette ARC	6777
2A	W1TX/1	Connecticut Wireless	
		Assn.	10,539
3A	W5KHB/5	Old Natchez ARC	12,357
4A	W2OYH/2	Morris RC	18,090
5A	W2YKQ 2	Lake Success RC	12,033
6A	K2AA 2	South Jersey R Assn.	17,774
7A	VE3DOH/3	Windsor ARC	8367
8A	W9FQ/9	Wheaton Community	
		RA	8622
9A	W2GSA/2	Garden State AR	
		Assn.	21,366
10A	W7HZ/7	Valley ARC	30,357
11A	W7DK/7	RC of Tacoma	23,130
12A	W3RCN/3	Rock Creek AR	
		Assn.	16,749

On Field Day everybody "wins." If you're not top scorer in a particular transmitter class, then perhaps you're tops in your call area, state, or

Two operators here score for the Bedford County Amateur Radio Soc., W3AHS/3.

Constant swapping of alligator clips and acid burns on clothing . . . but it's all worth it for the extra multiplier available to Class B and C stations. This is the fine battery array of fifth highest scoring Class B station W5YJS/5 (left) and partner W5NCN (right).

county . . . or maybe you beat out that rival club for a steak dinner. Next year you can set your sights higher. Everybody won experience!

#### Class B

"The gear worked fine, and our score climbed up a bit-and-a-whistle over last year. Some day, just some day, we'll turn in that top Class B entry." Well, that some day arrived, as K6QHZ and K6EXO, signing K6QIK/6, brought home the bacon with that long awaited top Class B score in superlative fashion. 'Twern't easy though with perennial W2FBA/2, and W3YDF/3, W3DQG, 3, W5YJS, 5 and a host of other hopefuls bearing down all the way. Tenderfoot KN3OSV/3 aided by KN3OIO posted the highest FD Novice score ever recorded with 2025 points, 23rd high of all Class B entries. Summing up unit/individual operation, K6QFS/6 decreed: "Battery power is the only way . . . no generator hash etc. It took only six minutes to set up the entire station."

#### Class C, Mobiles

Records . . . records . . . records . . . in the mobile class, the Radio Amateur Mobile Soc. (Sacramento, Calif.) shot a gaping hole in all previous mobile records, with 51 mobiles combining their scores for 124,073 points. That s an average of 2433 points per member . . . gadzooks! W6QYY/6, with three operators manning two rigs, led the triumph with K6UKH/6 highest single-operator mobile score. The Westpark Radiops, who have had a strangle-hold on this category for years, tumbled to third, pushed aside also by the Phil-Mont Radio Club (Pa.), led by their club mobile

van, W3RQZ/3. In the mobile division, 175 participated — a fine showing indeed.

#### In Conclusion

Unfortunately, Field Day becomes a memory all too quickly . . . 1961 FD no exception. Let these quotes bring back fond memories and relive those pleasant FD experiences, and also stir us to begin thinking of Field Day 1962. It's never too early to start making those plans!



### CLUB AGGREGATE MOBILE

SCORES
Radio Amateur Mobile Society (Calif.) 124,073
Phil-Mont Mobile Radio Club (Pa.)
Westpark Radiops (Ohio)
San Gabriel Valley Radio Club (Calif.) 25,048
Mobile Amateur Radio Club of South Bend. 12,115
Argonne Radio Club (Ill.)1364
Roanoke Valley Amateur Radio Club671
Parma Radio Club (Ohio)

#### Quotes

"Another two months of planning and backbreaking work is over. The antenna poles and antennas have finally come to rest on the ground, and the logs have been deciphered. The final ration of linament and suntan lotion has been passed out - to those who haven't already passed out. I have heard nothing except the immortal phrase, 'Never again!' Atop an inaccessible mountain we braved snakes, 111-degree heat, poison ivy, and various vermin, to once again prove that amateurs are crazy. So it is with humbleness and pained relief, that we submit our Field Day logs. - North Bay AR Assn., K6TWT/6. See you next year!' We operated from the banks of the mighty Columbia with the idea of promoting better public relations, which we believe we did. A great many visitors wandered through out site asking questions and observing the orderly operation. Our local radio station reported our progress hourly via relay through W7JVF. The local TV station spread the word often and a local newspaper gave us all the space we desired."—Richland ARC, W7VPA/7...." Did you supply of 'dope' kept them away from the operating posi-

CLASS A CALL AREA LEADERS



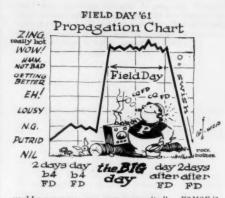
tions." - Halifax ARC, VE1FO/1. . . "We attempted to use helium-filled balloons to support 80-meter vertical, but the wind made the antenna more horisontal than vertical."—Hialeah ARC, W4MRC/4.... "Activities were hampered the first day when someone left the gate wide open to the field where we were operating. All our work came crashing down when a horse charged into the field from a neighboring farm, ran into the tower's guy wire, broke it, and let tower and antennas fall." — Oh-Ku-In VHF Radio Soc., W8DQK/8. . . . "Noticed an extreme amount of courtesy on the bands, especially when calling CQ. The answering station in almost all cases QSY'd and left the frequency to the original station that had called CQ. Heard one station get a DX call, and he explained that was in a contest. The DX station then said he would not hold him up, but the U. S. station told him he always had time for DX chit chat, cortest or not."—Sourega ARC, K4MCL/4..."Two complete stations were set up in a Volkswagon bus."— $K9UTI/\theta$ ...."As a conclusion of this first experience in FD, we suggest not to fool around on the FD site too long before the starting of the FD period, because a large part of 'our pep' was gone when the time c me to go on the air." — VE2OX/2. . . "Field Day is a shot in the arm for our club. Members who do not attend meetings all year work like beavers on FD. This year's outing left us at a high pitch, and it looks like we'll avoid our usual summer slump,"—Kinston AR Soc., W40IX/4... "The boys really enjoyed the late movie after their hour shift, even though the tent was kind of crowded." — Checktowaga Amateur Transmitting Soc., W2ICZ/2. . . . "When the contacts come fast and furious, you use anything for a log. Some of the newer hams have decided that the old timers can still rack up the contacts, because of experience and patience. Seems that just lots of calls, fast QSY, flashy o erating procedures, and wild phonetics don't automatically bring contacts on the run. A lot is learned on FD about shortcomings, facilities, physical limits, etc. It's good for the fraternity!" - Casper ARC W7VNJ/7. . . . "New club . . . first FD. Everyone had a sleepless time." — East Contra Costa ARC, K6POR/6. "FB conditions, courteous ops, and plenty of activity made this the best FD ever. Is Murphy's Law weakening?"

— Wells County ARC, K90J1/9..., "We held our breath on the generator, a new c.d. unit that had not been operated an hour. It started on the first pull though and purred along without a miss. We received much favorable pre- and post-Field Day publicity in several newspapers."

— Bedford County AR Soc., W3AHS/3...."Dipoles high in Eucalyptus trees were terrific. Tree climbers, as



This rare candid shot, taken within the confines of a FD servicing shop for units that require major on-the-spot repair, reveals an inaccurate chronometer timepiece being adjusted and calibrated by a skilled technician of the Flambeau Amateur Radio Club, W9BLW/9.



used by power company, were a necessity." — K6MSK/6. ... "We had one fellow try to make coffee with white gas!"—Black River Valley RC, K2GVR/2... "The club went up to the Cherokee National Forest, The location afforded excellent propagational facilities as well as a most beautiful and inspiring view." - Loudon County ARC. K4UPX/4... "A tent pole snapped and we were nearly buried alive." — K1IVK/1... "We had a good laugh when all operators fell asleep at the rigs and the generator ran out of gas. Everyone slept for about an hour before someone realized what had happened." —  $K0MPG/\theta$ ... "We had a ball." —  $W\theta ALG/\theta$ ... "After a period of FD inactivity, our club came back this year. The result is nothing to brag about, but for sure we did get in there and did the best with what we had."—Amateur VHF Institute of New York, W2WCR/2.... "This was the first time many of our members ever worked s.s.b. We were very surprised at the results, especially when we worked Saudi Arabia when we were just testing out the rig."—*Tu-Boro RC*, *W2BMW/3...*"Murphy had the upper hand this year for us."—*Chisholm Trail ARC*, *K5DUJ/5...* "Operated 75-meter s.s.b. from a treehouse." — The Ken-more Society, K2MTV/2.... "There was a lot of public interest which was helped by posters and good local newspaper coverage before and after the event."— The Tube and Shutter Club, W@CVJ/0, . . , "When 10-meters opened up our local communications ground plane became our foremost antenna. The ground plane was located on top of Mort Matansas, 60-feet above the inter-coastal waterway. Outboard motors caused ignition noise 5-9, a halfmile away! What other club in the country had complete control over a national monument for 21 hours? What other club occupied a 221 year-old fort isolated from land on an island in one of our inter-coastal waterways? Everything had to be carried by boat, including the two-kw. generator."

— Ancient City ARC, W4UHC/4... "We got out like a burglar on 80 but not so well on 40. Gangway for next year." — W3NNL/3... "The Novice station at our Field Day site was the only one to start at the set time. The others were two hours late because of generator trouble." — KN8 VYL/8. . . . "Our old reliable putt-putt burned 22 quarts of high grade motor oil and only three gallons of gasoline. No piston rings."— K9KGA/9.... The ultimate disaster occurred this year; the generator caught fire when one of the operators refueled it without stopping the engine. This put a severe cramp in the operating activities. The club's old 350 watt unit was retrieved from its burying place and after being rebuilt on the spot, was pressed into service. Now we know enough to use the fuel pump on the generator instead of filling the tank." Chicago ARC, W9CAF/9. . . . "The club had an opportunity to use its newly bought first aid kit, when K3EUG discovered that after a continuous 24-hour running period, the generator manifold is hot."— Adams County AR Soc.. WSKGN/3. . . . "After burning up four transmitters and faced with the prospect of going home defeated, we hooked up our v.f.o. directly to the 80-meter antenna, making 40 more contacts with the v.f.o.'s 2E26."—Lacey ARC, K71TL/7... "Thought we had the ideal FD site on the beach on Kent Island, until we found the nearby owner of the property had a 21-Mc. i.f. TV set. Kinda dampened our best phone band." - W3HEC/3. . . . "No speakers

were taken to the Field Day site. For once we could carry on a conversation in the operating room. Flagpoles are dandy antenna supports when they are so plentiful." Ohio State University ARC, W8LT/8. . . . recently built a new airport. We set up our Field Day stations in the old terminal building, no longer in use. One of the triband beams was on top of the old 65-foot control tower, with the other up about 40 feet on a boom truck. We think we had one of the best locations and station setups in the entire country." — Ruchester ARC, WOMXW/O, "Our biggest problem was keeping our cook on his feet. He tripped over our tent ropes and exposed tree roots; but he looked after us during the wee hours of the night." Leavenworth ARC, W7AEY/7. . . . "Why not have some article by one of the high scoring clubs to show us how they get the big ones?" - Walton R Assn., W2LZ/2 [If they'll write 'em, we'll print 'em. — Ed., | . . . "We found the audio limiter described in 'How To Get Rid of the Other Fellow's Key Clicks' (McCoy, QST, January 1960, p. 44) extremely effective in getting rid of key clicks from neighextremely enecute in gectual ratio k according to the property energy for our club since 1953. We'll be back next year." -Kaw Valley, RC,  $W\theta HS/\theta$ ... "We got a large charge operating Field Day." -KtLRB/l... "Tri-band elements were straightened while 50-feet up by casting expert K8STP with a fishing rod." - Indian Hills RC, W81CS/8. . . . "The various colors of the enclosed Field Day log sheets (tan, blue, and green) aptly describe the Club members' condition after FD. We are tan from the Florida sun which beat down unmercifully during the erection of antennas. We are blue because we aren't sure if we won the Florida Skip FD Trophy. We are green with envy over some of the scores of other clubs." - Dade RC, W4NVU/4. . . . club travels more than 80 miles to our FD site. With the elevation a cool 7200 feet, snow is a problem on the road to the site. Fish abound in the high lakes just below our operating positions, providing us trout for breakfast, lunch, and dinner. A whale of a good time is had by all."—North Hills RC, K6QWL/6...."Our club's ace-in-the-hole was a TA-33 beam on a hundred-foot tower. This seemed to have made the difference for us."—Lafayette ARC, K5SGX/5...."Location was an abandoned radar site, highest point in the county. As this was U. S. government property, all operators were locked inside the gates for the duration of the FD week end." - SWANI RC, No. Group, W9CCN/9. . . . "Did any of you guys ever haul a gaspowered generator miles to the Field Day site, only to discover it created a 40-over-9 disturbance? We did!"— Crescent Bay Emergency Radio Net, K6LDA/6. . . . "Murphy ignored us this year. Everything went off as if we knew what we were doing." — Mid Mo ARC, KØETY/Ø. . . . The station was established in a small house trailer and towed to a remote section of Manatee (Fla.) County known as Snead Island, reached by bridge from the mainland. The QTH was at the extreme western point of the island, with the waters of Tampa Bay and the Manatee River on three sides." — Manatee ARC, K4BDT/4. . . . "The generator tuckered out one minute after FD was over." — York ARC, W3EDU/3. . . . "The QRN was very heavy because of electrical storms in the area. Six inches of water accumulated in the tent, and one time the group was driven away from the site by lightning."—Convair ARC, W58JZ/5... "FD is 'like FB.""—Hellertown ARC, K3JJV/3. ... "FD is 'like FB. — Hearthur, "We're happy to report the biggest turnout in our control of these registered in club's history with 85 people out, 80 of these registered in AREC. YLs operated 40 phone and came through in fine style." - Genesee County RC, W8.1CW/8. . . . up a mile of electric fence wire for 40 s.s.b., but it didn't load up too well."—Sangamon Valley RC, W9DUA/9.
..."Let's try RTTY next year."—Sidewinders RC, K6LSZ/6...."Our club held down the Southwestern

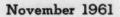


W3LVC employs the age-old Armstrong method of rotating the 6- and 2-meter beams for the Friendship Amateur Radio Club, W3GR/3.

tip of the United States. From our location at Border Field we were within a few hundred yards of the Pacific and also within sight of the new Tiajuana bull ring just across the border to Mexico." — North Shores ARC, K6H AI/6. . . . This one was for Scotty, W2PWX, who joined Silent Keys last year. Two meters was his band and it just didn't seem the same this year. Quite a few fellows said they missed hearing his voice." — Garden State ARA, W2GSA/2. . . . "The local newspaper and radio station leaned over backward to give us outstanding coverage. The mayor of New Rochelle (N. Y.) again named the two-day period as 'Amateur Radio Days' in tribute to civil defense and to the hams who play such an important part in planning for natural and man-made catastrophe." — Communications Club of New Rochelle, K2YCJ/2. . . . "Highlight of the day was when WA6OCC tried to fasten a radial wire to a 'crooked stick.' It rattled and crawled down into its hole."—The Corona Gang, W6LYM/6. . . . "S.s.b. activity finally came into its own in the 1961 FD. Our hats off to those home stations whose participation help run up the s.s.b. contacts." - Miami Valley AR Contest Soc., W8CEA/8. "The site was 450 feet above the surrounding terrain with line-of-sight 30 miles in any direction. The results from the inverted 'V' antennas were truly gratifying."—

Milwauke Radia Amateura' Club, W9HRM/9..."FD Milwaukee Radio Amateurs' Club, W9HRM/9... "FD site was on top of Overlook Mountain which is a two-mile trip up a dirt road. No equipment failures helped make this the best FD the club has ever had." - Ulster County Mike Key Club, K2YOU/2. . . . "All operating was done from a new emergency communications center that the club constructed in an old donated school bus. Club members have completely refurbished the interior, installing benches, power outlets, equipment to cover all amateur bands, and local police and emergency two-way radio channels. The exterior was finished in official civil defense









The sign in front of the v.h.f. setup of the San Antonio Radio Club, W5SC/5, facetiously proclaims this tent to be for "six and two meters, home of the video rangers." That handle can't hold much water though, as 143 QSOs here helped the club to score 15,583 points.

colors." — Owensboro ARC, W4SUD/4. . . . "Perched on a grassy cliff-edge 110 feet above Puget Sound, the view, weather, equipment, motor-generator, and conditions were superb." - AR Communications Service, W7RGL/7. . . . The company again gave us permission to use their microwave relay site. Antennas were strung from the guys of the 160-foot microwave tower." - Louisville Gas & Co. Amateurs, W4JRA/4. . . . "Greater part of the operating was done by teenage hams, which resulted in a higher score than last year." - St. Petersburg ARC, W4GAC/4 "Our tents didn't have rugs, but did we have bugs! -St. Clair ARC, K9GX U/9. . . . "This is the third year we've been using s.s.b. on the lower bands and it sure is far superior to a.m. on FD. However, we could sure use another half-dozen good c.w. operators. Our 15-kw. generator performed like a precision machine, gulping down more than 50 gallons of gas."—Raritan Bay Radio Amateurs, K20ML/2, . . . "Thanks to the inverted V-shaped dipole article by K7GCO (Glanzer, QST, August, 1960, p. 18), the 40-meter gang did a wonderful job. We're really sold on this antenna." - Western Electric ARC, K9AVO/9. . . . "We borrowed a hearse and had three transmitters set up in it. Could that be the reason the bands were so dead?"— Orange County ARC, W6ZE/6. . . . "Thanks to an insane tree climber in getting up a good antenna, we broke our 200-QSO barrier." — W9TOR/9. . . . "We set up operations next to a pig farm during slaughtering time. What a smell! Naturally we were downwind 95% of the time."— K4LDR/4... "The XYL and I had a ball. We were camped within 20 feet of Big Pine Creek, up 8000 feet in the clear, cool air. I watched her catch rainbow trout while I hammed. What more could one want for a FD outing? The complete station (in a Campbell's soup box) stays in the pickup truck, and goes along on all trips from now on. The truck makes a fine shack." — W@CIS/6. . . . "Heard 6000 stations easily, but they couldn't hear me! — K4CXF/4. . . . "No sweat this year. Ole Murphy took a holiday." — K1ITU/1. . . . "The receiver conked out on nonday.— KITC/I. . . The receiver consed out on us, but KBBRS happened by out of nowhere to loan us a 75A-1."— K4QET/4. . . "Egad, what a mess. Even a skunk was about creating quite a smell."— WA6AWD/0. . "On two meters, I used a conthanger antenna, three feet off the ground."— KN1RIH/1. . . "We used a novel antenna, a longwire suspended from four six-foot diameter belium balloons held together by a parachute. It worke I fine on long wave stations, but poorly on 6 and 2." - Research City AR Assn., W1EUH/1. . . . "The club set up in a clearing at the wood lot of Mt. Tom State Park Reservation. In looking for some poles to support a tar-paulin over the generator, W1UWX climbed up on the woodpile and found himself facing a large timber rattler. Needless to say, Cliff beat a hasty retreat. The rattler was quickly pinned down. The rattler was 47 inches long and had 13 rattles. Later, the ranger said it was the largest seen in years in this part of the country. The rattler is to be mounted and displayed in the park museum." — Pioneer Valley RC, W1AEW/1. . . . "All antennas were dipoles with their centers attached to a 65-foot pole, topped with a 2-meter ground plane." - San Gorgonio Pass ARC K6QYF/6. . . . "The Novices could kick themselves for not having their General class licenses. We took slides of the whole operation and will show them to about 1800 high school students, to get more interested in ham radio and show the student body what ham radio is all about. Elkhart High School ARC, K91XS/9. . . . "While listening on 2-meters, I heard K2IYU/2 calling 'CQ FD' and I proceeded to call him, until I realized the call I was using was K2IYU/2 -- crossband modulation," - K2IYU/2. "Since everybody worked together and had fun together, regardless of their own personal love for a particular type of emission or band, we had a most successful and enjoyable club activity."—Shenandoah Valley ARC, W4RKC/4... "Two barns and a milkhouse were our temporary headquarters for the exercise. The small barn had a horse, 100 chickens, and a hay rack and loader; we set up our c.w. station here. The milkhouse had the 80meter rig, while the large barn with the cows, young bull, and wagon sheltered the 6-meter and 20/15-meter rigs." — Evendale ARC, K8LUC/8. . . . "To stay in three-transmitter class, we had multiple dipoles to the same feedline on 15- and 6-meters. We had a receiver on both bands at the same time, so we could switch bands fast." - Bayside ARC, WA2LAQ/2...."We got good coverage on TV, with two stations running pictures of the Field Day setup." — Houston ARC, W5DPA/5. . . "Our 20-meter s.s.b. setup was in an all metal warehouse. We found it easier to work KH6s by reflecting a signal off the metal warehouse with our beam east." - Old Natchez ARC, W5KHB/5. "Beam Stadium, a local baseball park at Albrook AFB, Canal Zone, was truly 'beam' stadium for us. The 10-meter station was located in the hot dog stand, the 15-meter station in the showers, the 20-meter station in the visitor's dugout, and the 40/80-meter boys in the bleachers. - Caribbean Air Command MARS Club, KZ5AF/KZ5. . . . "Mt. Pacifico, over 7000 feet high, is graced with beau-tiful pine trees 40 to 50 feet in height. Therefore, the bulk of our antennas were dipoles, fourteen in fact. Climbing the trees was fun. Try keeping your nerves when your atop a 50-foot pine when a 30 m.p.h. gust sweeps over that mountain. Every inch it sways seems like a foot. Next year I wear a parachute."—Santa Monica City College RC, W6SNK/6... "Antennas were about 112 feet off the ground atop an old 97-foot fire tower." — K9DPU/9... We decided to participate in FD this year after an absence of about ten years in this type of operation. As there was a complete lack of trees at the site, the use of guyed extension ladders for masts facilitated the erection and



"We camped in a mosquito bog. Mosquitoes were so big that one tried to carry off K2SPG, but brought him back when he realized the real BIG ones down by the river might take Jim away. We trained two mosquitoes and had them put up our 80- and 40-meter antennas. All in all, it was a typical Murphy's Law type Field Day."

— Pi Net Radio Club, K2SPG/2

dismantling of our antennas."—St. Thomas CD ARC, VE3 TCD/3. . . , "The effort put forth is not mirrored in the score achieved. However, right in the middle of near north Chicago, a FD station was established inside a Red Cross panel truck. It was a good demonstration that we can set up either local or long distance communications on short notice in an emergency." - Chicago AR Disaster Corps, K9UAO/9. . . . "Any 6-meter stations in Eastern Mass. had a chance for a Vermont contact this year. We put up a 6-meter rhombic and aimed it at Boston. At times six sounded like 75-meter phone." — Windham RC, KtDJH/1. . . "Our secret weapon this year was four half-waves in phase on 80, and a 40-meter vertical supported by a 12-foot balloon filled with hydrogen. This antenna was carried away by a wind storm."—Sabine Valley ARC, W5VFM/5... "Next year will be sure of operators and get gear collected and checked in advance, so we won't get caught all alone and without working equipment." W8CXS/8.... "Oh brother, I still can't look a radio in the face. It was hot—108 degrees; the cotton-pickin' generator goofed up, gremlins in the carb; and not enough operators showed up. But, after a shower, shave, and liberal application of sunburn lotion, it was fun."—El Dorado County ARC, W6MIX/6... "Erection of our full-sized 40-meter beam took many hours of labor, but it was a masterpiece. Of course, this was too good, so it fell not once but twice. Highlight was K4YWW observed sleeping with his eyes open. Field Day with our group is something to forget rather than remember." - Royal Fraternity of Screwballs, K4GSD/4. . . . "Between a shorted coaxial antenna cable and power failure with the generator, the 'aly old FOX' got very little sleep." - Delmont RC. W3FOX/3. . . . "One hour was lost because of generator failure. This was caused by the vent in the fuel tank being plugged, and the engine eventually starved itself of fuel. Being a diesel engine, the whole fuel system had to be bled of air locks. MORAL: leave nothing to chance!" — South Shore ARC, VE2ADX/2 [Don't even leave nothing! - Ed.] . . "Our only problem was keeping inquisitive cows from chewing up our tents and rubbing their heads on the guy wires. We followed the idea of low power with high-gain antennas, and it really paid off. We found s.s.b. a must. Also changing our call from VE3SRC helped quite a bit - Scarboro ARC, VESWE/S. . . . "The crew received a little experience in actual emergency traffic. While monitoring the local net frequency Friday night before FD, an urgent call was heard for Merle, W7IKG, one of the members of the club. One of his daughters had developed acute appendicitis and it was imperative that Merle be contacted to sign necessary legal releases for the operation. Merle, however, was not at the Field Day site but was at his home which for the moment was without a commercial telephone. However, the boys were able to relay traffic, contact another member of the club who lived close to Merle, get him over to his house, and get all parties to the hospital in time for a successful operation."—RC of Tacoma, WTDK/7... "Stations varied from tents to a surplus converted Greyhound bus. This bus was quite an attraction to the local visitors."—San Antonio RC WSSC/5... "We tried a 'V' beam with success." Club des Jeunes Operateurs, VESJC/8... "A lot of fun was had by a lot of hams."—WSWUT/8... "Our location overlooked a scene of many former exciting days, as we were in the press box of the old Green Bay Packers Stadium." - Green Bay Mike & Key Club, K9EAM/9. . "This FD ended with disaster when approximately 150



The log keeper here fades away into oblivion, as KØWWW keys on for the West Suburban Radio Club of Minneapolis, KØWWW/Ø. Note the gas funnel, an excellent lampshade.

homes in our location of Ft. Worth became flooded after five inches of rain during the night." — K5PAW/5.... "Almost lost the beam to an irate camper." — K9JII/9. 'The gang found one well-frightened rattlesnake and a 5-foot blacksnake, now a fatality. After all was over we checked the s.w.r. on 40 and 20 to find out why this shouldn't have been our best Field Day." - Penn Central RC. K3AHS/3. . . . "Other than the 80-meter rig not working right, rain, static from the weather, rain, DX-100 on 15 phone blowing a filter condenser, rain, having to stop four hours early, and among other things rain (or have I said that), we had a lot of fun, even though the score was shot." - K5EQV/5. . . . "One operator went around pulling up weeds to make room for his chair and table. Found out later it was poison sumac," — Burlington Short Ware RC K2MXN/2, . . . "We had to drive 52 miles over mountain roads to our FD site. What about some others roughing it like us?" — Walla Walla Valley RAC, W7DP/7.... At five o'clock in the morning we were still waiting for the band to thin out, but it never did." -- Queen City Emergency Net, W8VVL/8. . . . "Considerable time was spent training operators in operating techniques. Next year we plan on conducting a school several weeks before FD for the purpose of having these new fellows ready for action when they are needed." — East River RC, K4YEG/4. . . . "One "One interesting incident was the contact that ended with a shock from a stray piece of coax between the equipment. The stray coax turned out to be the antenna which was supposed to go through the s.w.r. bridge to the transmitter. Nevertheless, it was a good contact." - K1MHW/2. . . "For the first time in the history of our club, we participated in Field Day, and to say the least, it was a most enjoyable and exciting occasion." — Grey Bruce AR Assn., VE3GBN/3.

After cleaning up and removing some old dynamite found lying around, this old logger's line shack made an excellent shack for logging Field Day contacts for the Tualatin Valley Amateur Radio Club, W7UTV/7. Standing is K7GSM, club president, while FD Chairman W7ADU in the foreground tunes the receiver, an SWL logs, and W7DIS Assistant FD Chairman tunes in the background.



#### CLASS A

W2FT/2 K8DXF/8 W5SA/5 KØEUD/4 VE2CO/2

KØWEW/Ø W4DIJ/4 K7AYF/7 W7TQC/7 WØUNT/Ø K5FJC/5

W6MIX/6 WA6GWD/6 KØPTK/Ø

W2TIO/2

Class A stations are clubs and groups in the field. Scores are tabulated according to the number of transmitters operated simultaneously at each station. The figures and letters following each call indicate the number of valid contacts, the power inputs used, the number of participants at each station and the final score. The "power classification" used in computing the score is indicated by the letters A, B or C after the number of QSOs shown. A indicates power up to and including 30 watts (multiplier of 3); B indicates power over 30, up to and including 150 watts (multiplier of 2); C indicates over 150 watts (multiplier of 1).

K2DXV/2         RA of Greater Syracuse.         593- A-11- 4           K9JAU.9         (nonclub group).         465- A-3- 4           W2ZRC/2         RA of Erre County.         452- A-3- 4           K8ITH/8         McKinley High School RC.         433- A-5- 4           W88MK/8         Cuyahoga Falls RC         33- A-5- 4	W5AQR/5 W9BKC/9 VE3HCD/3 K9WWW/9 7777 K9UNI/9 VE7A8M/7 066 K8AB/8 211 K28PG/2 914 K9MGG/9 K4PEG/4 W4TWW/4
KSSGX / 5	777 K9UNI/9 219 VE7ASM/7 066 K8SAP/8 211 K2SPG/2 914 KØMGG/Ø K4PEG/4 752 W4TWW/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4 410 W4UHC/4
K9JAU/9   STRUME   A 3-4	752 W4TWW/4 410 W4UHC/4
W88MK/8 Cuyahoga Falls RC	410 W4UHC/4
W88MK/8 Cuyahoga Falls RC	009 12861810 /8
W88MK/8 Cuyahoga Falls RC	293 K5CEB/5
	293 K5CEB/5 VE7PQ/7 122 K9YCJ/9
	W3CD1/3
C. W. CHOUP 71 200- 12-0- 2	122
WØLUX/Ø Winona ARC 624- B-10- 3	744 KØKKQ/9 690
W#DEP/# (nonclub group) 385- A- 4- 3 W8NCF/8 Tusco RC 381- A- 8- 3	854 WSMTP/8
W8NP/8 Massillon ARC 378- A-10- 30	654 W6MTP/6 627 WA6OWM/6
K6LDA/6 Crescent Bay Emer-	K9YBV/9
gency Radio Net	K9YBV/9 618 W5URW/5 600 K8BTP/8 W8EHZ/8
WSRTR/8 Canton ARC 375- A-30- 30 WSCK/5 Order of Boiled Owls of	600 K8BTP/8
New Mexico 372- A- 8- 3	573 WSEHZ/8
VEIJV/1 Pictou County ARC 369- A- 8- 3 W7OTV/7 Oregon Tualatin Valley	EAG STEAM PART OF
W7OTV/7 Oregon Tualatin Valley	W9YCR/9
W5CK/5	504 W9YCR/9 504 W9OYR/9 483 W2UMI/2
KSEPV/8 Brass Pounders ARC 362- A-10-3 W5FKX/5 (nonclub group) 553- B-5-3	483 W2UM1/2 450
W5FKX/5 (nonclub group) 553- B-5-3 KθETY/θ Mid-Mo, ARC 392- AB-12-3 W7DTT/7 K-W Club 4/6- AB-9-3	354 VE3RC/3
W7DTT/7 K-W Club. 476- AB- 9- 3	345 W7FO/7
W7DTT/7 K-W Club	276 W7QXS/7 114 KØJKS/0
KSEPV/8         Bass Pounders ARC         362         A-10-3           W5FKX/5         (nonelub group)         55.1-         B-5-3           K6ETY/9         Mid-Mo. ARC         392-         AB-12-3           W7DTT/7         K-W Club.         4/6-         AB-9-3           W8BLY/8         Whitter Radio 50 Club.         334-         A-12-3           K3MJW/3         Skyview R Soc.         519-         B-15-3	114 KØJKS/Ø
	354 VE3RC/3 345 W7FO/7 276 W7QXS/7 114 KØJKS/Ø 111 W3NNL/3
MOFAH / BAIO All FORCE MARS 452" ALF 6" 9	111 W4UYQ/4
	988 W8CIA/8
K2AZJ/2 (nonclub group) 302- A- 5- 2 K5MDV/5 Jefferson Parish ARC 481- B- 5- 2	988 W8CIA/8 943 W9CHD/9
K5MDV/5 Jefferson Parish ARC . 481- B- 5- 2	550 K3OU1/3
KøHLU/Ø (nonclub zroup) 466- B- 4- 2 W8ODJ/8 Buckeye Shortwave RC 465- B- 7- 2	796 W3VI/3 790
	772 WSOCU/8
NASDI//4 Manasce ARC. 418- AB-42 2 W7UJI/7 McMinnville ARC. 360- AB-11- 2 W3EDU/3 York ARC. 293- A-11- 2 CORRESS (2008) AB-42 2 (unpubly cross) 294- AB-43 2 4 4B-44 2 4B-	676
W7VJF/7 McMinnville ARC 360- AB-11- 2	676 K9TIG/9 658 KØEJS/Ø 637 VE4DF/4
WSINS/8 Muskingum AR Assn., 443- B-40- 2	658 KØEJS/Ø 637 VE4DF/4
WSINS/8 Muskingum AR Assn. 443- B-40-2 WSINS/8 WSIND(7 3 York AR Assn. 443- B-40-2 WSIND(7 4 YORK AR A	619 KØVTE/Ø
K2ISP/2 (nonclub group) 396- AB- 5- 2 W3EAN/3 Main Line Dandies 411- AB- 3- 2	592
K5LJL/5 Lake View ARC 286- A- 3- 2	574 W8JGB/8
KØAVZ/Ø         Mae West RC         402-         B- 6-         2           WØJTP/6         Tamalpais ARC         391-         B-15-         2           W2YGW/2         (nonelub group)         253-         A- 6-         2           K9ZMR/9         Sun Prairie AR Klub         250-         A- 8-         2	532
W6JTP 6 Tamalpals ARC 391- B-15- 2 W2YGW/2 (nonclub group) 253- A- 6- 2	496 K6BAJ/6 477 VE4AC/4 475 WØCDP/Ø
W2YGW/2 (nonclub group) 253- A- 6- 2 K9ZMR/9 Sun Prairie AR Klub 250- A- 8- 2 K5TNR/5 Crescent City Teenage	477 VE4AC/4 475 WØCDP/Ø VE3HK/3
	\$73/9 EF 67 /9
	436 K6 TRA/6 430 KN8VYL/8 376 K5 YSW/5
K2BEV/2 South Amboy AR Assn. 270- A- 8- 2 W9NGI/9 Soc. of R Operators 393- B-20- 2	430 KN8VYL/8 376 K5YSW/5
W9NG1/9 Soc. of R Operators. 393- B-20- 2 W5SJZ/5 Convair ARC. 256- A-15- 2 W1CK/1 Burlington AR Asen. 229- A-12- 2	304 K9KGA/9
W1CK/1 Burlington AR Assn 229- A-12- 2	286 W9CAF/9
RC 237- A-10- 2	268 K2SKO/2 262
KAMSM/4 (monclub group) 277. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	262 K3USN/3
WackFig Minneapolis RC 375- B- 2	250
W@CKF/Ø         Minneapolis RC         375-         B-         -         2           W5CYN/5         Hot Springs ARC         374-         B-20-         2	244 KSUUU/8
WØCKF/Ø         Minneapolis RC	241
W9NUW/9 Wisconsin Valley R Assn	232 W2OXU/2
Assn. 372- B- 3- 2 W5CVU/5 (nonclub group) 219- A- 3- 2 W4MM/4 Albany ARC 337- B-25- 2	196 WA2IKP/2
W4MM/4 Albany ARC 337- B-25- 2 K2IYO/2 Salem County RC 330- B- 6- 2	172
K2IYO/2 Salem County RC 330- B- 6- 2	130 W5YM/5
	194 WOUNDERSO
W4BKV/4 Tallahassee Contest	124 W9TWM/9
W4BKV/4 Tallahassee Contest	115 VEZAHD/7
W4BKV/4 Tallahassee Contest ASSI	115 VE7AHR/7
W4BKV/4 Tallahassee Contest Assn	115 VE7AHR/7
W4BKV/4         Tallahassee Contest           Assn.         354-         B- 3-           KSMFK/8         (nonclub group)         210-         A- 8-           KSMAN/9         Calumet ARC         304-         AB- 7-           K3JJV/3         Hellertown ARC         318-         AB-15-	115 VE7AHR/7
W4BKV/4         Tallahassee Contest           Assn.         354-         B- 3-           KSMFK/8         (nonclub group)         210-         A- 8-           KSMAN/9         Calumet ARC         304-         AB- 7-           K3JJV/3         Hellertown ARC         318-         AB-15-	115 VE7AHR/7
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7 115 085 KØLZJ/Ø 076 W4ELO/4 049 WØCXK/Ø 035 VE1GM/1 022 VE6QE/6 010
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7 115 085 KØLZJ/Ø 076 W4ELO/4 049 WØCXK/Ø 035 VE1GM/1 022 VE6QE/6 010
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7 115 085 KØLZJ/Ø 076 W4ELO/4 049 WØCXK/Ø 035 VE1GM/1 022 VE6QE/6 010
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7 115 1085 KØLZJ/9 076 W4ELO/4 049 WØCXK/9 022 VE6GE/6 010 W2BV/2 090 WØTIA/9 992 KØBSV/8
W4BKV/4         Tallahassee         Contest           KSMFK/8         Assn.         354- B- 3- 2           KBMAN/9         Calumet ARC         304- A8- 7- 2           KBJJV/3         Hellertown ARC         318- AB- 15- 2           K4YOQ/4         Hillsborough AR Soc.         346- B-48- 2           W4EM/4         Mid-South AR Assn.         300- AB- 7- 2           W1KKE/1         Providence R Assn.         201- A-15- 2	115 VE7AHR/7 115 185 KØLZJ/Ø 076 W4ELO/4 049 WØCXK/Ø 035 VE1GM/1 022 VE6QE/6 010 W2BV/2 004 WØTIA/Ø 992 K8BSV/8 999
\( \text{W4BKV/4} \)  \text{Tallahassee Contest} \)  \( \text{Assn} \)  \( \text{Assn} \)  \( \text{SMFK/8} \)  \( \text{Komfan, 9} \)  \( \text{Calumet ARC} \)  \( \text{Calumet ARC} \)  \( \text{318-AB-15-2} \)  \( \text{EdJJV/3} \)  \( \text{Hellertown ARC} \)  \( \text{Calumet ARC} \)  \( \text{318-AB-15-2} \)  \( \text{V4EM/4} \)  \( \text{Hellertown ARC} \)  \( \text{S0.318-AB-15-2} \)  \( \text{V4EM/4} \)  \( \text{W1KKE/1} \)  \( \text{W1KKE/1} \)  \( \text{W1KKE/1} \)  \( \text{V7/2 tris-State AR Soc.} \)  \( 312-AB-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	115 VE7AHR/7 115 185 KØLZJ/9 1076 WELO/4 049 WØCXK/9 035 VEIGM/1 1022 VE6QE/6 1010 W2BV/2 004 WØTIA/Ø 1992 K8BSV/8 1999 W2YNU/2
W4BKV/4	115 VE7AHR/7 115 185 KØLZJ/Ø 176 WELD/4 049 WØCXK/Ø 135 VEIGM/1 1010 1010 W2BV/2 004 WØTIA/Ø 18989 102 W2YNU/2 104 WYNZJ/7 105
W4BKV/4	115 VE7AHR/7 115 185 KØLZJ/Ø 176 W4ELO/4 149 WØCXK/Ø 152 VE6QE/6 100 W218V/2 100 W711A/Ø 1992 K8BSV/8 1999 W7NZJ/7 1990 W7NZJ/7 1990 W7NZJ/7 1990 W7NZJ/7
W4BKV/4	115 VE7AHR/7 115 185 KØLZJ/Ø 1076 WELD/4 049 WØCXK/Ø 1035 VEIGM/1 1022 VEGQE/6 1010 W2IBV/2 004 WØTIA/Ø 1992 K8BSV/8 1992 W2YNU/2 1908 W2YNU/2 1908 K5ZDI/5 1908
\( \text{W4BKV/4} \)  \text{Tallahassee Contest} \)  \( \text{Assn} \)  \( \text{Assn} \)  \( \text{SMFK/8} \)  \( \text{Komfan, 9} \)  \( \text{Calumet ARC} \)  \( \text{Calumet ARC} \)  \( \text{318-AB-15-2} \)  \( \text{EdJJV/3} \)  \( \text{Hellertown ARC} \)  \( \text{Calumet ARC} \)  \( \text{318-AB-15-2} \)  \( \text{V4EM/4} \)  \( \text{Hellertown ARC} \)  \( \text{S0.318-AB-15-2} \)  \( \text{V4EM/4} \)  \( \text{W1KKE/1} \)  \( \text{W1KKE/1} \)  \( \text{W1KKE/1} \)  \( \text{V7/2 tris-State AR Soc.} \)  \( 312-AB-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	115 VE7AHR/7 115 185 KØLZJ/Ø 176 W4ELO/4 149 WØCXK/Ø 185 VEIGM/1 1010 W2BV/2 1010 W2BV/2 10902 K8B8V/8 1899 W2YNU/2 1900 W7NZJ/7 1908 W5ROC/5

Plainview ARC		272-	AB-12-	1875
Plainview ARC Mason County RC. (nonclub group)		288- 203-	AB-12- A- 4-	$\frac{1860}{1827}$
F to a to a way and a first of the	S	200-	A- 5-	1800
Group. (nonclub group). Sheboygan Cour DXers. (nonclub group). (nonclub group)		333- 271-	B- 5- B- 4-	$\frac{1798}{1776}$
DXers	aty	281-	B- 7- B- 6-	1776
(nonclub group) (nonclub group) Shy-Wy RC Anaconda ARC Lawrence ARC		292- 265- 265-	B- 4- B-11-	1776 1752 1740 1740 1734 1734
Anaconda ARC		264- 289-	B-15- B-11-	1734
		264-	AB- 9-	
El Dorado County A	RC	161-	A- 9- AB- 4-	1680 1674 1668
(nonclub group) Pine Ridge ARC (Gr	oup	160-	A-13-	1665
Royal Order of Lig ing Dodgers. Ville Platte RA. Arrows RC	hten-	274- 182-	B-10-	1644
Ville Platte RA		269-	B-10-	1638 1614
Sarnia ARC	C of	250-	B- 3-	1614
Minneapolis Valley VHF Club Fraser Valley ARC Hillsdale ARC Pl Net RC	***	267- 177- 152- 176- 150- 174-	B- 6- A- 7- A- 4-	1593 1593
Hillsdale ARC		176-	A	1584 1575
	***	174-254-	A- 3- B- 4-	1566 1524
(nonclub group) Ancient City ARC		218- 249-	AB- 3-	1521 1512
(nonclub group) Comox Vailey ARC.		167- 135-	A- 3- A- 5-	$\frac{1503}{1440}$
(nonclub group) (nonclub group) Ancient City ARC (nonclub group) Comox Valley ARC Gibson ARC Baltimore Polytech Institute RC	inte	168-	AB- 9-	1413
East Central Mi	nn.	235-	B-10-	1410
(nonclub group)	***	235- 155-	B-10- A- 4- A- 4-	1410 1395
(nonclub group) (nonclub group) Michiana VHF RC	***	155- 129- 225-	A-14- B- 4-	1395 1395 1386 1350 1344
Port Lausea ARC Quake R Assn University High S	lehool		B-18-	1344
RCDartmouth ARC	***	197-	B- 4- B- 8- AB- 6-	1332 1326
RCDartmouth ARCQuad-City ARCMancorad RC.		221- 207- 219-	AB- 6- B-12-	1332 1326 1323 1314
Assn		193-		
		193- 191-	B-12- B-14-	$\frac{1308}{1296}$
Falls City ARC	***	191- 187- 187- 141-	B-10- B-12- B-14- B- 5- B- 4-	1308 1308 1296 1272 1272 1269
			A- 3-	
Louisville ARC		164- 211- 140-	AB-10- B- 3- A- 3-	1269 1266 1260
fense Louisville ARC (nonclub group) Short Skip RC Huntingdon Coul	ntv	163-	AB-12-	1257
		204-	AB-12-	1254
Manistee (nonclub group)		176- 200-	B-15- B- 3- B-20-	$\frac{1206}{1200}$
(nonclub group) Galua ARC Cranberry Portage A Albert Lea Spider AR Assn	RC	166- 165-	B-20- B- 8-	1146 1140
AR Assn	web	164-	B- 6-	1134
AR Assn Hickory Corners El neering Soc Yuba-Sutter RC	ugı-	150- 188-	AB- 3-	1131
AR League of Manit Arkansas Valley RC. Elliott Lake ARC.	oba	162- 183-	B- 4- B- 3- B- 7-	1128 1122 1098
		158-	B- 8-	1098 1089
(nonciuo group)		96- 117- 175-	A - 8-	1089 1053
(nonclub group) Chicago ARC		175- 148- 172-	A-12- B- 3- AB-12-	$\frac{1050}{1050}$
6 Meter Club of Dalla (nonclub group) Chicago ARC Canadair ARC Peanut Whistle Radiators	Net		B- 8-	1032
Radiators Philadelphia Naval F ARC Buckeye Shortwave	Base	171-	B- 3- AB-15-	1026
Buckeye Shortwave	R	113-	A- 7-	1017
Assn Boys Club of E Aurora Plainview High S		142-	B- 4-	
ARC	chool	160-	AB- 5-	
University of Arkan ARC. Kishwaukee RC.		167-	B	1002
Time Ruper Sin	M.C.	332-	C-20-	996
(nonclub group)		110-	A- 3- B- 3-	990 984
(nonclub group) Omaha ARC Yarmouth ARC		164- 162- 137-	B-12- B-10-	972 972
Contrant Mineral a		162-	В	972
Cumberland RC Homesteader ARC.		159- 133-	B- 6- B-15-	954 948
Agan		154-	B-10-	924
Ridgewood High Sch RC Great Falls RC Six Meter Club of S		123- 128-	AB- 9- B- 7-	921 918
Antonio	San		A- 6-	909
Baldwyn AR Klub (nonclub group)		101- 123- 138-	B- 8- AB- 3-	888 888

WA2ISE/2	North Syracuse Central High School RC. Adams County AR Soc. Dunn County RC. Junn County RC. Hastings ARC Wildwood Station ARC (nonciub group) For A RC. Yale AR Soc. Yale AR Soc. Yale AR Soc. Horring ARC. Northland ARC. Northland ARC. Western Stope RC. Terrace AR Assn. Elmira AR Assn. Clinton ARC. Clinton ARC. Northland Station ARC. Northland RC. School RC. School RC. School RC. Mich. M	* 40	73 0	0.50
W3KGN/3	Adams County AR Soc.	117-	B- 3- B- 8-	
W3KGN/3 K9KSR/9 K2SVU/2	Dunn County RC	141-	B- 4- A- 5-	846
KØSOQ/Ø	Hastings ARC	106-	B-20- B- 6-	786 762
K9TZI/9	(nonclub group)	111-	B- 3-	756
K2SVU/2 KØSOQ/Ø KL7WAF/KL7 K9TZI/9 WØFVT/Ø K8UZQ/8 W9AIQ/9	Yale AR Soc	114-	B- 5- B	720 684
W9AIQ/9	Bonner County ARC	113-	B- 8- B-14- B-10-	678 660
W9BCY/9	Northland ARC	108-	B-10-	
VE7AJY/7	Terrace AR Assn	82-	A- 8- B- 6-	648 642
W2ZJ/2 KØZPC/Ø	Elmira AR Assn	194-	B-13- C-14-	594 582
KØEVC/Ø	Storm Lake ARC	70-	B- 3- AB- 3-	570 555
KSUZQ/8 W9AIQ/9 K7JEP/7 W9BCY/9 WØRRZ/Ø VE7AJY/7 W2ZJ/2 KØZPC/Ø W1BH/1 W8GQN/8 K7ITL/7 K9QLD/9	Straits Area RC	89-	B- 6-	534
K9QLD/9	Notre Dame High	99-	A= 5=	531
WØFOG/Ø W8J1U/8	Smoky Valley RC	87-	B- 6-	528 522
W8JIU/8	8, 9, 9 Assn. of Midland Mich	1.52-	AC- 8-	498
W7TMI/7	Mich. (nonclub group). Wheat Straw ARC.	80- 53-	B- 4- B- 5-	480 473
WAZDSR/Z	Forty Meter Zero Beats	77-	AB- 4-	465
K2DNN/2	Chemung County AREC. Stephen F. Austin ARC	51-	B- 9-	456
W5FZX/5 KØDDL/Ø W8AX/8	Stephen F. Austin ARC (nonclub group)	51- 69- 45-	H- 6-	414
WSAX/8 WA2KIP/2	(nonclub group)	134-	A- 5- C- 7-	402
	Assn. Pine Ridge ARC (Group	42-	A= 6=	378
KØALY/Ø	2)	61-	BC- 4-	354 324
VE2AXO/2 K8KXJ/8	(nonclub group)	36-	AB- 3-	321
KH6DEX/KH6 K1MJO/1	(nonclub group)	149-	B- 4- B- 3-	298 266
K1EIN/1 W2VSP/2	(nonclub group) (nonclub group) (nonclub group) (nonclub group) (nonclub group) RA of Greater Syracuse (Group 2)	42-	B- 3-	252
KSDAW/8	(Group 2)	126-	AB- 6- B- 6-	252 252
K8DAW/8 WØQHB/Ø W8ACQ/8	(Group 2) (nonclub group) Central Iowa VHF Club Chippewa ARC (A	126- 25-	A= 5=	225
	Group)	78- 34-	B-10- B- 4-	208 204
WØCIW/Ø KN8ZSP/8	Group) Fullerton RC Kalamasoo ARC (Novice Section) Dunsmuir ARC Newberg ARC Hamsters ARC Melvindale High School	11-		
W6KII/6	Dunsmuir ARC	21-	B- 3- B- 7- B- 7-	126
W6KII/6 W7MRW/7 K3JKJ/3 KN8ZOW/8	Newberg ARC Hamsters ARC	58- 40-	AB	100
KN8ZOW/8			AB-10-	81
	Youtpeton Illah Dahaal			
KIJMQ/1	RC.	7-	A- 5-	63
Two 7	Lexington High School RC Personal Presentation Presentati	ltanco		
	ransmitters operated Simu	ltanco	usky	
Two 7 WITX/1 W3WJD/3	ransmitters operated Simu	ltanco	usky	
Two 7 W1TX/1 W3WJD/3 W288C/2	Connecticut Wireless Assn Frankford RC, Group A Niagara Frontier DX	ltanco	usky	
W1TX/1 W3WJD/3 W288C/2 W7CO/7	Connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington	1146- 1182 1001-	A-20-1 -AB- 5- A-10-	0,539 9933 9234
W1TX/1 W3WJD/3 W288C/2 W7CO/7	Connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club	1146- 1182 1001-	A-20-1 -AB- 5- A-10-	0,539 9933 9234
Two 7 W1TX/1 W3WJD/3 W2SSC/2 W7CO/7 W3MFW/3 W3ATR/3 WSCEA/8	ransmiters Operated Simu Connecticut Wireless Frakford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club Flitzabethtown AR Soc. Beacon RA Miami Valley AR Con- test Sgc.	1146- 1182 1001- 937- 893- 805- 784-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13-	9234 8568 8262 7470 6264
Two 7 WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W8CEA/8	ransmiters Operated Simu Connecticut Wireless Frakford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club Flitzabethtown AR Soc. Beacon RA Miami Valley AR Con- test Sgc.	1146- 1182 1001- 937- 893- 805- 784- 668- 675-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- AB-14-	0,539 9933 9234 8568 8262 7470 6264 6237 6042
Two 7 WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W8CEA/8	connected Simulation of Connected Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington Elizabethown AR Soc Beacon RA. Miami Valley AR Contest Soc. Miwaukee RAC Circuit Freakers ARC. Candlewood AR Assn.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- AB-14-	9933 9234 8568 8262 7470 6264 6237 6042 5850
Two 7 WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W8CEA/8	connected Simulation of Connected Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington Elizabethown AR Soc Beacon RA. Miami Valley AR Contest Soc. Miwaukee RAC Circuit Freakers ARC. Candlewood AR Assn.	1146- 1182 1001- 937- 893- 805- 784- 668- 675-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- AB-14- A-30- B-20-	0,539 9933 9234 8568 8262 7470 6264 6237 6042
Two 7 W1TX/1 W3WJD/3 W2SSC/2 W7CO/7 W3MFW/3 W3ATR/3 WSCEA/8	connected Simulation of Connected Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington Elizabethown AR Soc Beacon RA. Miami Valley AR Contest Soc. Miwaukee RAC Circuit Freakers ARC. Candlewood AR Assn.	1146- 1182 1001- 937- 893- 805- 784- 668- 678- 624- 902- 684-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- A13- AB-14- A-30- B-20- AB-11-	60,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313
Two 7 WITX/1 W3WJD/3 W288C/2 W7C0/7 W3MFW/3 W3ATR/3 W5CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4UYF/4 W9RFU/9 WISEL/3 K50II/5	connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club. Elizabethtown AR Soc. Beacon RA. Miami Valley AR Contest Spc. Milwaukee RAC. Candlewood AR Assn. Hampton Roads RC. Band Hoppers Levation Contest Spc. Levation Roads RC. Levation Rc.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- A-14- A-30- B-20- AB-11- A-7- B-5-	0,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313
Two 7 WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W3CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4UT/4 K4UT/4 W9RT/9 W3ISE/3	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- AB-13- AB-11- A-7- B-5- AB-35-	9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313 5058 5040 4914
Two 7 WITX/1 W3WJD/3 W288C/2 W7CO/2 W3MFW/3 W3ATR/3 W3CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4UY-1/4 W9RFU/9 W3CHM/3 K5OJL/5 W8COE/8 W9GEE/9 W3GHM/3	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AB-13- A-13- AB-14- A-30- B-20- AB-11- A-7- B-5- AB-35- AB-6-	9,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313 5058 5040 4914 4902 4818
WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W3ATR/3 W5CEA/8 W9HRM/9 K3CLF/3 W1VB/4 K9HFU/9 W3ISE/3 K50II/5 W8COE/8 W9GEE/9 W3GHM/3 W4KVK/4	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -Al3-5- A-10- A-20- A-14- A-12- AE-13- A-13- AB-11- A-30- B-20- AB-11- A-7- B-5- AB-35- AB-6- B-15- AB-15- AB-15-	9,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313 5058 5040 4914 4902
WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W3ATR/3 W5CEA/8 W9HRM/9 K3CLF/3 W1VB/4 K9HFU/9 W3ISE/3 K50II/5 W8COE/8 W9GEE/9 W3GHM/3 W4KVK/4	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -Al3-5- A-10- A-20- A-14- A-12- AE-13- A-13- AB-11- A-30- B-20- AB-11- A-7- B-5- AB-35- AB-6- B-15- AB-15- AB-15-	0,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313 5058 4914 4902 4818 4672 4601
WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W3ATR/3 W3CEA/8 W9HRM/9 K3CLF/3 W1VB/4 K4FL/9 W318E/3 K5OJI/5 W8COE/8 WØEEE/Ø W3GHM/3 W4KVK/4 W3HTK/5 W9LL/9 8	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -Al3-5- A-10- A-20- A-14- A-12- AE-13- A-13- AB-11- A-30- B-20- AB-11- A-7- B-5- AB-35- AB-6- B-15- AB-15- AB-15-	9,539 9933 9234 8568 8262 7470 6264 6232 5850 5562 5313 5058 5040 4914 4902 4818 4788 4671
WITX/1 W3WJD/3 W288C/2 W7CO/2 W3MFW/3 W3ATR/3 W3ATR/3 W5CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4VF/4 W9RFU/9 W3ISE/3 K5OII/5 W8COE/8 W9EEE/θ W3GHM/3 W4KVK/4 W5HTK/5 W9LJ/9 KSIMN/8 K5KMS/5 K2YOU/2	connected the vice of the connected with the connected wireless Assi. Frankford RC, Group A Niagara Frontier DX Assi. Western Washington DX Club. Western Washington DX Club. Maini Valley AR Concess Sec. Milwaukee RAC. Circuit Freakers ARC. Candlewood AR Assi. Hampton Roads RC Band Hoppersservation of Key Clicks, Splatter & TVI. Texas Instruments ARC Kanawha RC.	1146- 1182 1001- 937- 893- 805- 784- 668- 675- 624- 902- 684- 537- 815- 789-	A-20-1 -AB- 5- A-10- A-20- A-14- A-12- AE-13- AE-13- AE-14- A-30- B-20- AB-31- AB-35- AB-35- AB-35- AB-15- AB-15- AB-15- AB-16- B-16- AB-13- B-16- B-16- B-16- B-16- B-18- B	60,539 9933 9234 8568 8262 7470 6264 6237 6042 5850 5562 5313 5058 5040 4914 4902 4818 4671 4602 4581 4602 4581 4602 4437
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WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3CEA/8 W9HRM/9 W3CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4UYF/4 W9RFU/9 W3CHM/3 W4EE/9 W3GHM/3 W4EE/9 W3GHM/3 W4EE/9 W3GHM/3 W4EVK/4 W9HFU/9 W3GHM/3 W4EVK/4 W9EP/9 W3GHM/3 W4EVK/4 W9EP/9 W3GR/3 K4ALI/4 W1BFB/1 W5WIH/5 W3TDF/3 W4BFB/1 W5WIH/5 W3TDF/3 W4GQVT/2 W3GR/3 K4ALI/4 W1BFB/1 W5WIH/5 W7RGI/7 W8AW/8 W6OFW/8 V6GCCK/3	connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington Western Washington Elizabethown AR Soc. Beacon RA. Miami Valley AR Con- test Soc. Miwaukee RAC Circuit Freakers ARC. Circuit Freakers ARC. Circuit Freakers ARC. Circuit Freakers RC. Soc. for the Preservation of Key Cilcks, Splat- ter & TVI Texas Instruments ARC Kanawha RC. Missourl School of Frankford RC, Group B Audubon AR Soc. Enid ARC. Lake County ARC (nonclub group). (nonclub group). (nonclub group). (incomply Mike & Owensboro ARC. Pikes Peak RA Assn. Sloux Falls ARC. Missispip County Mike & Assn. Friedis Theiday Boys. Bridge RC Friendship ARC. Pensacola ARC Southern Rhode Island DX & Prop. Assn. South Plains ARC. ARC. ARC. Reform Rhode Island DX & Prop. Assn. Bendix RC. Reform RA Assn. Bendix RC. Beldison RA Assn. Bendix RC. Beldison RA Assn. Bendix RC. Beldison RA Assn. Bendix RC. Bellins ARC. Beldison RA Assn. Bendix RC. Bellins RRC. Beldison RA Assn. Bendix RC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RRC. Bellins RC. Bellins RRC. Bell	1146- 1146- 1146- 1182 1001- 937- 893- 805- 784- 688- 675- 624- 884- 537- 789- 635- 761- 7738- 742- 884- 711- 748- 669- 718- 669- 718- 668- 508- 655- 508- 655- 508- 665- 528- 665- 528- 6604-	A-20-1- -Al3-5- A-10- A-12- A-14- A-12- A-14- A-12- Al-13- Al-13- Al-14- A-30- B-21- B-5- AB-3- B-6- B-15- B-16- B-16- B-16- B-16- B-16- B-16- B-19	0.539 9933 8568 8262 8262 7470 6264 6264 6264 6267 6363 5313 5040 4914 4914 4914 4788 4671 4602 4581 4674 4437 4437 4437 4437 4404 4437 4416 4416 4416 4416 4416 4416 4416 441
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WITX/1 W3WJD/3 W288C/2 W7CO/7 W3MFW/3 W3ATR/3 W3CEA/8 W9HRM/9 K3CLF/3 W1VB/1 K4UYF/4 W9RFU/9 W3ISE/3 K50JI/5 W8COE/8 W9EEE/9 W3GHM/3 W4KVK/4 W5HTK/5 W9LJ/9 K5KM8/5 K2Y0U/2 W4SUD/4 K9TBF/6 W3CWY/9 W4ALI/4 W3FTDF/3 W3CDU/9 W4ALI/4 W5FTH/5 W3CD/7 W4WJD/9 W4ALI/4 W5FTH/5 W5ENL/5 W3TDF/3 K4ALI/4 W5FWH/5 W9UDU/9 WA2GVT/2 W4SUD/4 W5ENL/5 W3TDF/3 W4WJDF/3 W9UDU/9 WA2GVT/2 W3GR/3 K4ALI/4 W5FWH/5 W7RGI/7 W8AW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8 W8OFW/8	connecticut Wireless Assn. Connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club. Basabethtown Manni Valley AR Con- test Sgc. Milwaukee RAC Circuit Freakers ARC. Circuit Freakers ARC. Circuit Freakers ARC. Candlewood AR Assn. Hampton Roads RC Band Hoppers RC Soc Structure Freakers Soc Group Freakers Soc Group Freakers Soc Group Freakers Soc Group Group B Audubak R Soc. Missourt School of Mines RC. Group B Audubak R Soc. Lake County ARC (nonclub group) (noncl	1146- 1146- 1146- 1182 1001- 937- 893- 805- 784- 688- 675- 624- 884- 537- 789- 635- 761- 7738- 742- 884- 711- 748- 669- 718- 669- 718- 668- 508- 655- 508- 655- 508- 665- 528- 665- 528- 6604-	A-20-1- -Al3-5- A-10- A-12- A-14- A-12- A-14- A-12- Al-13- Al-13- Al-14- A-30- B-21- B-5- AB-3- B-6- B-15- B-16- B-16- B-16- B-16- B-16- B-16- B-19	0.539 9933 8568 8262 8262 7470 6264 6264 6264 6267 6363 5313 5040 4914 4914 4914 4788 4671 4602 4581 4674 4437 4437 4437 4437 4404 4437 4416 4416 4416 4416 4416 4416 4416 441
WITX/1 W3WJD/3 W2SSC/2 W7CO/7 W3MFW/3 W3ATR/3 W3ATR/3 W3ATR/3 W3ATR/3 W5CEA/8 W9HRM/9 K3CLF/3 K1UYF/4 WØRIT//9 W3ISE/3 K50JI/5 W8COE/8 W9EEE/Ø W3GHM/3 W4KVK/4 W9EEE/Ø W3GHM/3 K5MIN/8 K5KMS/5 K2Y0U/2 W3GHM/3 W5WIL/9 K5KMS/5 K2Y0U/2 W3GHM/3 W4UDL/9 K5KMS/5 K2Y0U/2 W3GHM/3 W5WIL/5 W4SUD/4 KØTBE/Ø W5ENL/5 W3UDL/4 KØTBE/Ø W5ENL/5 W3TDF/3 W9UDL/9 W5ENL/5 W3TDF/3 W9UDL/9 W3CGV/9 W4JRA/4	connecticut Wireless Assn. Connecticut Wireless Assn. Frankford RC, Group A Niagara Frontier DX Assn. Western Washington DX Club. Bisabethtown AR Soc. Bisabethtown AR C. Circuit Freakers ARC. Circuit Freakers ARC. Candlewood AR Assn. Hampton Roads RC Bond Hoppers RC. Soc Group Roads RC Soc Group Roads RC Bisabethtown ARC Missourt School of Mines RC. Group B Audubea AR Soc. Lake County ARC Honelub group) (nonclub group)	11146-11182 1001-1937-784-1959-1968-653-789-668-658-658-658-658-658-658-658-658-658	A-20-1 -AB-5 -A-10A-10A-20A-14A-12AB-13A	0.539 9033 8568 8262 8262 6264 60237 6042 5562 5562 5563 5563 5313 5058 5040 44783 4671 44783 44783 44783 4437 4437 4437 4437 4

W4UA/4	High Point ARC	410	20.40	0001
W9CLH/9	(nonelub group)	613	B-12- B-10-	3071
WØERH/Ø	(nonclub group) Johnson County ARC.	509-	B-11-	3678
K4JRU/4	Warner Robins ARC	399-	A-10-	3648
W8LT/8	Warner Robins ARC Ohio State Univ. ARC.	539-	AB-15-	
W3PSH/3	Keystone ARC	368-	ADMIG	3040
WOMXW/0	Rochester ARC	749-	A- 7- BC-26-	9294
WØMXW/Ø WØENR/Ø	(nonclub group)	438-	AB- 6-	3534
K9MAR/9	Point RA	481-	AB-16-	3457
K6BEP/6	Point RA	401-	'A De Libe	0401
	High School RC			
	High School RC Alumni Assn.	382-	A- 5-	3438
K7CBP/7	Klamath Basin AR			0.400
	Assn	550-	B-12-	3390
K4ART/4	(nonclub group)	386-	AR. 5.	3258
WIWFB/1	Miliford ARC	541-		3246
W8VTD/8	Warren AR Assn	334-	A-10-	3231
K8NYM/8	Tire Town RC	511-		3228
W3YA/3	SUBIL OF MAXA	358-		3222
KL7AIZ/KL7	Adak ARC Tidewater Mobile RC.	534-	B-10-	3204
K4IAJ/4	Tidewater Mobile RC	505-	B-24-	3180
W5FQ/5	Meridian ARC	529-	B	3174
K518K/5	Meridian ARC. Oklahoma State Tech.			W. C. X
	AR ASSII.	503-	B-12-	3168
VE3RM/3	(nonclub group)	501-		3156
VE7AAM/7	(nonclub group) Penticton CD ARC	323-		3132
W9YT/9	Badger AR Soc	315-		
W9YT/9 K8UTT/8 W2TCU/2	Ford AR League	512-	B-30-	3078 3072
W2TCU/2	Auburn AR Assn. Wilcox Electric ARC	311-	A-20-	8024
	Wilcox Electric ARC	477-	AB- 6-	2005
W8MFY/8	Intercity RC	330-	A-18-	9070
VEHIM/1	Annapolis Valley ARC		B-15-	2046
K4JLA/4	Spartanburg ARC St. Clair Valley ARC	464-	B-17-	2934
VE3DFU/3	St. Clair Valley ARC.	464-	B-17-	2934
K6RMO/6	DX-Ploiters	429-	AB- 4-	2916
W4YJS/4	DX-Ploiters (nonclub group) Leavenworth ARC	458-	B- 5-	2898
W7AEY/7	Leavenworth ARC	320-	A- 8-	2880
W8VPV/8	Cuyahoga Falls RC			
	(Phone Group)	378-	AB-15-	2874
W9FJ/9	Chicago R Traffic Assn	357-	AB-11-	2856
K3HUO/3	South Community			
	Cuyanoga Falls RC (Phone Group) Chicago R Traffic Assn., South Community YMCA RC Walton R Assn. Bartlesville ARC Milford ARC	450-	B-14- A- 7-	2850
W2LZ/2	Walton R Assn	316-	A- 7-	2834
W5N8/5	Bartlesville ARC	357-		2775 2748
W8LYU/8	Milford ARC (nonclub group) All Band AR Klub	458-	B-12-	2748
K9RAS/9	(nonclub group)	279-	A- 8-	2736
W3RSC/3	All Band AR Klub	423-	AB-11-	2700
	South Bend ARC	274-	A-35-	2700
K5VOZ/5	Lawton-Fort Sill ARC.	874-	C-25-	2697
W0HS/0	Kaw Valley RC	449-	B- 5-	2694
K@QIK/0	Lawton-Fort Sill ARC. Kaw Valley RC. Lake Region ARC. Aliquippa Area RA	438-	B-12-	2628
K3DBE/3	Allquippa Area RA	400	77 . 0	
POHILE 10	Assn. Upper Arlington RC	266-	E1-14)-	2562
K8HHF/8	Upper Arington RC	325-	AB- 6-	2553
K4BV/4	Daytona Beach AR	100	-	
KILDD /I	Assn	400-	B-25-	2550
K1LRB/1	(nonclub group)	424-	B- 3-	2544
K8QIM/8	OBE PARK ARC	419-	B-15-	2514
W4MN/4 K7LYY/7 W2JC/2	Flathand Valley A DC	416-	B	2496
N/L/II//	Flatnead Valley ARC.	250-	A- 8s	2484
KØNRM/Ø	Fam Divo DC			2448 2412
K3BKL/3	Oak Park ARC Palmetto ARC Flathead Valley ARC Bloomfield RC Kaw Blue RC	207	B-15- AB- 8-	2412
		301-	A.D. 8-	2406
K3LDD/3	Philadelphia Electric			
	Co. Employees Assn.	270	410.05	9900
1210 A R.F. 70	RC	210-	AB-25-	4082
W8AM/8	Coffee Dunkers of De-	372-	B- 9-	anna
K2UNY/2	Tions AD Asses		B-15-	2382
W3AWA/3	Tioga AR Assn			
110/111/0	MUNIC SINCIS INC	200-	V-10-	2340



"The 20-meter antenna raising party with bow and arrow and string resembled a Laurel and Hardy comedy. They missed the tree completely on the first try and very nearly strung W6SY up by the leg on the second try. Tom finally came to rescue and showed them it takes a rugged frontiersman, used to repelling Tennessee Valley Indians, to accurately draw a bead on the nearest tree with a bow and arrow." — Soc. of Amateur Radio Operators, W6AEX/6

KØAXU/Ø	Northwest St. Louis			20.40	W3AHS/3	Bedford County AR	000	D 00	1000
K2OGW/2	Ramapo RC	375- 253-	B-13- A- 7-	2340 2313	W3UHN/3	Friendly AR Transmit-	200-	B-20-	
K8MIT/8 WA6MAO/6	Niles ARC Bay Area YL ARC	338- 284-	AB- 8- AB-11-	2301 2277	K4YJT/4	Mike & Key Club of	180-	B- 7-	
W4QAY/4 K9PFN/9	Central Virginia ARC Thornton Schools RC	378-	B- 7- AB- 8-	2268 2259	VE3PE/3	Greenville, S. C Stratford ARC	200-	B	1200
W9QQQ/9	Sparta ARC	374-	B- 6-	2244	W5ING/5 K6M8K/6	Baytown ARC (nonclub group)	198- 198-	B-25- B- 5-	1188 1188
K9INY/9	gion ARC	347-290-	B- 6- AB-11-	2232 2220	K2KKA/2	Six Meter Mobile Assn. of Western N. Y	135-	AB- 7-	1167
W8OG/8 W8ZZ/8	Springfield ARC	315-	AB-18- A-11-	2208 2169	K9HEA/9 WØOMA/Ø	(nonclub group)	193- 193-	B- 4- B- 8-	1158 1158
W8RB/8	Detroit AR Assn Buckeye Rag Chewers			2169	W7SWS/7 KØCGM/Ø	T. R. ARC. Magic Valley RA.	174- 235	B- 6-	1134
W8KEA/8	Net. Midland ARC. Stu Rockafella AR Soc.	241- 358-	A-30- B-10-	2148	W7EIL/7	Central Nebraska ARC Mt. Baker ARC Iowa Great Lakes ARC	184-	BC- 8- B-10-	1104
K8KII/8 KØWAL/Ø	Kansas State ARC	357- 357-	B B- 5-	2142	KOUOD/Ø KIOOM/I	51.30 Club	155-	B-12- A-11-	$\frac{1086}{1062}$
K8OBQ/8 W8MAI/8	(nonclub group) Blossomland AR Assn.	491-	AC- 8- B-12-	2076 2028	W2SV/2 KØOSS/Ø	Sunrise RC Suburban RC Jersey Palisades ARC.	174-	B-12- AB- 7-	$\frac{1044}{1023}$
VE2JC/2	Club des Jeunes Opera- teurs	251-	AB-13-	1986	K2MHP/2 W1ZLH/1	Jersey Palisades ARC Middlebury Mike & Key	134-	AB- 6-	999
VE5QC/5 W4NJT/4	"QC" Club	287- 325-	AB- 6- B- 8-	1986		Club	136-	B- 7- B-15-	996 978
W8IAD/8 K4MCL/4	(nonclub group)	326- 460-	B- 5- BC- 8-	1956 1896	VE3QCD/3 K3MMU/3 WA2TPV/2 K5INH/5	Kingston ARC. Juniata Valley ARC. 6-Up ARC of Burlington	135-	AB-12- A- 5-	978 972 954
K8BLS/8	Butler County VHF	290-	AB 12-	1890	K5INH/5 K2GVR/2	Temple ARC Black River Valley RC Iron Mtn., Kingsford	106-	A-10- AB-14-	954 927
K9UTI/9 K2IBC/2	Assn. (nonclub group)	289- 253	B-10-	1884 1860	K8IRC/8	Iron Mtn., Kingsford	153-	B-10-	918
W2MFF/2	Bergen-Passaic RC	245-	AB-16- AB- 6-	1854	K8RQB/8	Lubrizol RC	150-	B- 7- B- 3-	900
K4JIY/4 K4IVI/4	No. Augusta-Belvedere RC.	309-	B-20-	1854	K4FXG/4 VE1AO/1	(nonclub group) Truro ARC The Communicators	119-	B-20-	864 864
W8DOG/8	Forest City ARC	280- 280-	B-20- B-12-	1836 1830	KØZCJ/Ø K4UPX/4	Loudon County ARC.	111-	BC- 7 AB- 7-	858 849
W2MAU/2 WØVNI/0	Syracuse VHF Club Norfolk RC	509- 275-	BC- 7- B-11-	1806	K8LOD/8 W4SZK/4	(nonclub group)	138- 242-	B- 3- BC- 3-	828 822
W1ECV/1	(nonclub group) Southington ARC	337- 259-	BC- 7- AB-12-	1785 1779	WA2TIJ/2 KIQLY/1	Arma ARC Barrington High School	96-	AB-10-	813
W4PM/4 VE5NN/5	Hollywood ARC	170- 267-	A-12- B-12-	1755 1752	K5AGG/5	Red River Valley RC	124-	AB- 7- A- 6-	783 756
K2QEQ/2 K4CK/4	Explorer Post 304	266- 194-	B- 5-	1746	K6J8/6	Lick-Wilmerding High	125-	B- 3-	750
W6YA/6	Winter Haven ARC.	290-	A B- 6-	1746 1740	K1MVQ/1 W9OLX/9	(nonclub group)	108-	AB- 4- AB-13-	744 702
W5TOG/5 WA6DGZ/6	(nonclub group) Far West RC	287- 284-	B- 5-	1722 1704	K8RQA/8	Montgomery ARC Radio Transmittin	8 92-	AD-13-	102
K2BCI/2 K8KMK/8	Wantaugh RC Jackson County VHF	164-	A-10-	1701	1570 1 WYS 40	Communications Organization	115-	B- 7-	690
VE2OX/2	(nonclub group) Catalina RC	187-222-	A-20- AB- 4-	1683 1653	W9NSP/9	(nonclub group)	112-	B-10- A- 6-	672 657
K7IBX/7 VE3CKV/3	Catalina RC	269-	AP-11 B- 9-	1638 1632	W7ECA/7 K3LI8/3 W2DYM/2	(nonclub group) Electric City RC Pottstown YMCA ARC	297- 99-	B-16- AB- 4-	648 639
W6FBK/6 W4OIX/4	Humboldt ARC Kinston AR Soc.	246- 269-	B- 4- B- 8-	1626 1614	W2DYM/2 W1KFB/1	Greenwich High School	225-	AB1 6-	632
KØTOO/Ø W2UF/2	Kinston AR Soc. Coon Valley ARC Western Westchester	266-	B-11-	1596	K4SBO/4	RC Murfreesboro ARC	92-	AB- 5- B- 8-	630 624
K8RPI/8	RC Key Clicker's ARC	253- 261-	AB- 9- B-15-	1590 1566	K3NZX/3	Abington High School	102-	В	612
WØEEK/Ø W9VBU/9	Minot AR Assn	518-	C-10-		W9BSM/9 K9ONB/9	(nonclub group) Seymour ARC	85-	AB- 4- B- 6-	597 586
KølGO/ø	Council	258- 255-	B-11-		K2BFO/2 W5USN/5	North Country RC (nonclub group)	97- 97-	B- 3- B- 5-	582 582
W5FDQ/5	(nonclub group)	234-	B- 8- B-12-	1530 1524	W9AAH/9	(nonclub group)	97- 63-	B- 3- A- 3-	582 567
W2ICZ/2	Transmitting Soc	253-	B	1518	KIIVK/1 K5VWK/5	(nonclub group)	61-	B- 7- BC- 7-	516
K3EWY/3	Bucks-Mont Teenage ARC. Casper ARC. Mid-Island Six Meter	249-	AB-12-	1518	KØZQC/Ø KØMPG/Ø K9BFE/9	(nonclub group)	96- 82- 79-	B- 4- B- 6-	504 492
W7VNJ/7 K2PNR/2		251-	B		W9QAJ/9 K2TPZ/2	Owen County ARC Greater N. Y. VHF Net	79-	B- 8-	474
K6POR/6	Net Costa ARC	163- 161-	A-10- A-10-	1467 1449	K4ISK/4	Jax. Progressive RC.	73- 100-	B- 6- AB- 9-	438 438
W1WQM/1 VE2BEM/2	Port City ARC RC Saguenay	231-238-	AB-10- B- 8-	1434	WØALG/Ø VE4JW/4	(nonclub group) Beausejour RC	218-	B- 4- B- 4-	436 432
W8KEG/8 W4TGY/4	Tri-State AR Assn Suncoast VHF Club	238- 215-	B AB- 9-	1428 1377	KØJOQ/Ø VE3PCD/3	Norguehent AB Agen	44-	B- 4-	414
K90JI/9 W9TCH/9	Wells County ARC Rock River RC	229- 229-	B-10- B- 8-	1374 1374	W4NGV/4	(Porcupine Branch) Austin Peay State Col-	63-	B- 7-	378
VE2CBC/2 W4COY/4		228- 226-	B- 3- B- 8-	1368 1356	K5USE/5	No. Little Rock ARC.	141-	B- 4- B- 6-	366
KØGIA/Ø K9MAS/9	(nonclub group) Wichita Teens ARC	185-	AB-12- B-15-	1347 1338	W2WCR/2	of New York	91-	B- 5-	232
WØGHZ/9	Waupaca ARC. Des Moines Tech High School ARC	220-	B-10-		W2BMW/3 W3GFK/3	Tu-Boro RC. W.E.N.S. RC. Dit-Happy Dash-	112-	B- 9- AB	224 217
K4SZF/4 K7JHA/7	(nonclub group) Rodeo City RC	189- 185-	B- 3- B- 4-	$1320 \\ 1284 \\ 260$	W3HQX/3	Dit-Happy Dash-	107-	B- 8-	214
W7BUT/7 W7LA/7	Gallatin ARC	206-	B- 9-	1236	W8PIF/8 KØYIP/Ø K9QKG/9	M & M RC	50-	BC- 8- AB- 4-	192
KØBPR/Ø	Twin City RC	205~	B-10-	230	K9QKG/9	(nonclub group)	31-		192
W5CUQ/5	ARC Pittsburg County ARC. Convair RAC	179-	B-18-	1230 1224 1224	W6LKF/6	Paso Robles RC		B- 6- AB- 7-	186 159
K6DBS/6 W2HIP/2	Convair RAC Mid-Hudson RC	204- 176-	B- 6- B- 7-	1224 1206	VE3CYD/3	Chippewa Secondary School ARC Chisholm Trail ARC		BC- 7-	153
					K5DUJ/5	Chisholm Trail ARC	22-	B- 8-	132



YLs and XYLs have a proven attraction for scoring more phone contacts than the OMs. Here's WA6JMD (right) secretary of the Ventura County Amateur Radio Club, K6CST/6, at the v.h.f. position with K6ARK, club vice-president. (Official U. S. Nayy photograph.)

ARTS	Wannamaters Connected Column	ultan	lu
W5KHB/5	Old Natches ARC	1348-	A-15-12.357
W2IMM/2 KZ5AF/KZ5	Irvington RAC. Carlbhean Air Command MARS Club. Santa Monica City College RC. West Park Radiops. Vancouver ARC. Concord Brasspounders Miami Springs RC. Jacksgoville AR Soc.	1046-	A-56- 9594
W6SNK/6	mand MARS Club	1539-	B-15- 9384
	lege RC	870-	A-14- 7830
W8AF/8 VE7ARV/7 W1OC/1 W4SA/4 W4DU/4	Vancouver ARC	1061- 774- 777-	AB-25- 7644 A- 9- 7245
W4SA/4	Miami Springs RC	1052-	A- 4- 7218
W9AB/9 W3OK/3	Michiana ARC	831-	
W3OK/3 W5PDO/5	Los Alamos ARC.	867-	AB-40- 6822 AB-25- 6786 AB-18- 6762 B-25- 6756
W5PDO/5 W4ABK/4 W6LUC/6 VE7EZ/7	Kentuckyana RC Santa Barbara ARC	1101-	AB-18- 6762 B-25- 6756 B-10- 6678
	Concord Brasspounders Miami Springs RC. Jacksonville AR Soc. Michigan ARC. Delaware-Lebigh ARC. Los Alamos ARC. Kentuckyana RC Santa Barbara ARC. Victoria Short Wave Club.	708-	
W2UBW/2 W6PD/6	Mid-Island RC	701- 720-	A-16- 6534
W6PD/6 K5YJG/5 VE2ARC/2 W4AM/4	Suburban West ARC	1052-	B-31- 6462
W4AM/4	Frye ARC	998- 979-	A- 3- 6453 B-15- 6138 B-24- 5874
W5FC/5 W2MO/2 W5PAA/5	Foothill Mobile Net. Suburban West ARC. Montreal ARC. Frye ARC. Dallas ARC. Livingston ARC. Aeronautical Center	738-	AB-22- 5769
	Aeronauteal Center ARC Tri-County AR Assn., General Dynamics and Pomona Ham Club. Bayside ARC	706-	AB-40- 5673
K6AGF/6	General Dynamics and	788-	
WA2LAQ/2	Bayside ARC	589-	AB-51- 5619 A- 8- 5526 B-25- 5526
WA2LAQ/2 K8VHN/8 W6KA/6 VE3RAM/3	Rayside ARC	896- 589-	B-25- 5526 A-15- 5526
VE3RAM/3	Ottawa Valley Mobile	584-	A-15- 5481
W5GU/5 W7NTO/7 W4YKY/4 W2GLO/2 W6MSO/6 K6FAV/6 W9REG/9 W5DPA/5 K25PA/KZ5 K8UZW/8 K6GJ/6 W5ABD/5 K5WPH/5 K3MTK/3 W8MRM/8		854- 544	AB-15- 5448 A-14- 5121 AB-25- 5064
W4YKY/4 W2GLO/2	Lewis County ARC Lake AR Assn	794-	B-25- 5046
W6MSO/6 K6TWT/6	Inglewood ARC North Bay AR Assn	535-	A-16- 4980 AB-15- 4878
K6FAV/6 W9REG/9	Levittown ARC. Inglewood ARC. North Bay AR Assn. McClellan AR Soc. Tippecanoe AR Assn. Houston ARC.	689- 574-	AB-61- 4872 AB-20- 4818 AB 15- 4665
W5DPA/5		631-	AB 15- 4665 B-12- 4644
KSUZW/8	Parma RC	749- 734- 667-	AB-40- 4623
W5ABD/5	Parma RC Foothills AR Soc Westside ARC Sun City ARC	729- 746-	B-11- 4524
K3MTK/3		628-	AB-14- 4458
W8MRM/8 W4NG8/4	Motor City RC Columbus ARC and Ft. Benning ARC	713-	
	Benning ARC. (nonclub group). Mississippi AR Soc. IMO VHF ARC. RCA ARC. Indianapolis Burnaby ARC. River Park ARC. Richiano ARC. Richiano ARC. Ventura County ARC. Kingsport ARC. Vermillon County AR Assn.	708- 484-	B-10- 4368 A- 5- 4356 AB-35- 4332
K5RUA/5 W9BZN/9	Mississippi AR Soc IMO VHF ARC	689- 493-	AB-15- 4323
K9ZEI/9 VE7BAR/7	RCA ARC, Indianapolis Burnaby ARC	690- 442- 700-	B-30- 4290 A-36- 4203
W6KGP/6 K5RUA/5 W9BZN/9 K9ZEI/9 VE7BAR/7 W9OD/9 W7VPA/7 W1DDD/1	River Park ARC Richland ARC	697-	B-15- 4200
W1DDD/1 K6CST/6	Blackstone Valley ARC Ventura County ARC	670-	B-22- 4182 B-28- 4170 AB-18- 4167
K6CST/6 W4TRC/4 W9MJL/9	Kingsport ARC Vermilion County AR	668-	AB-27- 4161
W3BSF/3	Assn Western Pennsylvania DX Soc Ft. Meyers ARC Oil Capital Mobile Club Kalamasoo ARC	668-	B-40- 4158
	DX Soc	691- 685-	B- 9- 4146 B-20- 4110
W4KC/4 W5HMF/5 W8RYI/8	Oil Capital Mobile Club Kalamazoo ARC	579- 449-	AB-30- 4059 AB-15- 4059
W7ZA/7	Grays Harbor ARC. Gainesville AR Soc. Gulf Area YL AR Klub Arizona ARC.	495-	AB-35- 4032 B-12- 3954
K58KF/5	Gulf Area YL AR Klub	621-	B-12- 3376
WSHMF/5 WSRY1/8 WSRY1/8 WTZA/7 K4DPZ/4 K58KF/5 W710/7 W7RDL/7 K9QDE/9 W4BTI/4 VEIFO/1 VEIFO/1 W4MRC/4 K3JJU/3		387-	B-18- 3750 A-14- 3708 B-35- 3702
W4BTI/4	Kennehoochee ARC	591- 615-	B-17- 3690
VEIFO/I VEIPF/I	St. Croix Valley ARC.	568- 358-	B-15- 3564 A-10- 3537
W4MRC/4 K3JJU/3 W7YN/7	Windsor ARC	500- 386-	AB-12- 3519 A 3474
W7YN/7 W8DQK/8	Kokomo ARC. Kennehoohee ARC. Halifay ARC. St. Crbix Valley ARC. Hlaleah ARC. Windsor ARC. Nevada AR Assn. Oh-Ky-In VHF Radio Soc.	418-	AB-21- 3420
K2YNT/2	Soc	524-	AB-12- 3489
W7DP/7	Metuchen YMCA & Edi- son High School ARCs Walla Walla Valley	411-	AB-13- 3396
K6OBS/6		449- 458-	AB-13- 3384 AB- 3- 3356
K60BS/6 KØBXD/Ø WØHI/Ø W1KKS/1 K5TEF/5 WØRC/Ø K5TYP/5 W9AWE/9 K2PQL/2 W8VVL/8	Story County & BC	532 532-	B-12- 3342 B-18- 3342
WIKKS/I KSTEF/S	Manchester RC	468- 553-	AB-12- 3321
WØRC/Ø K5TYP/5	Wichita ARC	510-	B-23- 3210 B-23- 3180
W9AWE/9 K2POL/2	Western Illinois RC	594-	B- 8- 3174 BC-15- 3156
W8VVL/8	Manchester RC Curry County ARC Wichita ARC Keesler ARC Western Illinois RC Bethpage ARC Queen City Emergency Net	497-	B-32- 3138
KØYGV/Ø			AB- 9- 3135
W3URR/3 W3KOR/3	First State ARC Clear Field County AR	490-	B-20- 3102
W3KQR/3 WØEBE/Ø	Assn,	514-	B 3084
	ARG	513-	B-25- 3078
W5FTA/VO1 K5ZNR/5	ARG	468-	AB-11- 3072
K8BQD/8		417-	AB-11- 3012 B- 3- 3012
VEILC/I	Loyalist City ARC	489- 462-	B 2940 AB-20- 2931
KøLDN/Ø VEILC/I VE7FY/7 KIMUJ/I W3AYS/3	Cranbrook ARC. Iowa-lilinois ARC. Loyalist City ARC. Royal City AR Assn. Eastern Conn. AR Assn. Chesapeake ARC.	442-	AB-12- 2832 AB-15- 2784 AB-20- 2751
W3AYS/3 W8PZD/8	Chesapeake ARC Berea Radio Ops	345- 433-	AB-20- 2751 B-12- 2748



This is what a ski jump looks like to Otto von Champjümper before he makes his speedy descent — in der vinter of course mit snow. The Chain of Lakes Amateur Radio Club, W9ADZ/9, adorned this structure with beams. There's one on top as well as that monstrosity down below.

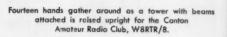
K4YEG/4	East River RC	429-	B-17-	9794
K8POE/8	Logan ARC	427-	B-15-	2682
WIAQ/I	Associated RA of South-			
W2CGK/2	ern New England	420-	B-15-	
VE3NSR/3	AR Soc. of Queens. North Shore ARC. Sydney ARC. Poinsettia RC.	417-	AB- 6- B-10-	2604
VEICR/1	Sydney ARC	372-	AB- 8-	2586
WA6BMH/6	Poinsettia RC	421-	AB	2553
W4NPT/4				
K1MHW/2	Norfolk, Va	425- 250-	B-11-	
W6IJK/6	(nonclub group) Sacramento Aerojet	200-	A- 4-	2493
	RAC	349-	AB-17-	2466
W4ETI/4	Tamiami ARC. Grey Bruce AR Assn.	399-	AB~ ~	2463
VE3GBN/3 K6LXV/6	Grey Bruce AR Assn	383-	B-10-	2460
W5MUZ/5	La Jolla Field Day ARC	408-	B- 8-	2448
W2CGJ/2	Ouachita Valley ARC Ridgewood ARC "Kenmore Society Bainbridge Brass Pounders.	376~	B B-15- B- 8-	2406
W2CGJ/2 K2MTV/2 K3ORS/3	"Kenmore Society "	373-	B- 8-	2388
K3ORS/3	Bainbridge Brass			
K7FBL/7	Pounders	389-	B-20-	2334
B.(EDL/I		200-	D 19	9924
W4ZA/4	MARS Club Richmond ARC	380-	B-12-	2280
W0CVJ/0	Tube & Shutter Club	353-	B-15- B- 7-	2268
W4RUL/4	Greeneville RAC	431-	BC-25-	2256
K6JKC/6	(nonclub group)	350-	AB- 5-	2256
W3SOB/3 W9ASM/9	York Road RC Central Home Brew	276-	AB-10-	2238
WOADMI/9	Club Home Brew	342-	B-10-	2202
K5ANN/5	Club	316-	13.19.	9106
WØBFE/Ø	Jayhawk AR Soc	323-		2186
K7IFR/7	ARC of Olympia	241-	AB	2076
K58AM/5	Edmond AR Soc	308~	AB-12-	2067
W3VV/3 W8WUT/8	Edmond AR Soc	342-	B-15-	2052
W2ODT/2	Adirondack RC	295- 326-	AB-20- AB- 9-	2049
WØCUO/Ø	Grand Island AR Soc	312-	BC-23-	
K9EAM/9	Green Bay Mike & Key	014	DC-23*	1900
******* · *** · **	Club	311-	B-18-	1866
W9VAR/9	(noaclub group)	222-	AB- 3-	
K5PAW/5 K8WBL/8	(nonclub group) Xavier Univ. ROTC RC	309-	B- 9-	1854
K9J11/9	(nonelub group)	308-	B- 7- B- 3-	1848
K9ZEV/9	Miami County RC	247-	AB-20-	1809
W4AB/4 W9EBN/9	(nonelub group) Miami County RC Proward ARC Sky Wire RC	280-	AB-25-	1794
W9EBN/9	Sky Wire RC	298-	B-12-	1788
KH6DIG/KH6		273-	B-15-	1788
VE3YJ/3 W3WDZ/3	London ARC Somerset County ARC.	296-		1782
K2YGY/2	Carteret CD Radio	290-	B- 6-	1770
	Group. Berwick AR Klub	353-4	ABC- 5-	1752
K3MCP/3	Berwick AR Klub	267-	B- 5-	1752
K8EMY/8	South East ARC	314-	BC-16-	1725
W3SJ1/3 W3FDG/3	Hazleton ARC	282-	AB-13-	1695
W6LIE/6	Ivyridge ARC	269-	B- 6- AB-22-	1656 1644
K8VXH/8	Genoa RC	252-	AB	1623
K0ZFK/0	Jefferon Barracks ARC.	231-		1605
WA6MXF/6				1602
W3FZC/3	AR Soc	174-		1556
W5HPI/5	Terry County ARC	259-	B- 6-	
K6CXI/6	Alexander Hamilton Sr.			
	High School ARC Atlanta Teenage RC	226-	AB- 9-	1553
W4IOF/4	Atlanta Teenage RC	230-	B-20-	1530
K9STH/9 K3AHS/3	Ponn Contral RC	229-	AB-12- AB-14-	1530
W6BML/6	La Porte ARC Penn Central RC Mount Shasta ARC	251-	B- 8-	1521
	Production of the City		20.0	EGEORO.



W3RQZ is the snazzy mobile communications center of the Phil-Mont Mobile Radio Club, hailing out of the Philadelphia area. The Phil-Mont boys were second high in mobile aggregate scores with 35,020.

Maritan I		W6MGJ/6	Helix ARC	1331- A-20-12,204
		W6UUS/6	San Francisco Peninsula MARS Group G. D. Astronautics	1213- A-35-11.142 1040- A-24- 9695
1200		W2OR/2 W8TO/8	G. D. Astronautics Pompton Valley RC Columbus AR Assn Crescenta Valley RC	1145- AE-30- 9411 1102- AB-31- 8790
650		W6HS/6 K4HEX/4	Crescenta Valley RC Lynchburg ARC	920- A-22- 8505 1014- AB-25- 8322
	HAVE TO SHOULD BE SHOULD B	W9OFR/9 K4G8D/4	Lynchburg ARC Joliet AR Soc. Royal Fraternity of Screwballs	889- A-50- 8226 887- A-15- 8217
		W4ULV/4 K2OML/2	Blue Grass ARC Raritan Bay RA	927- AB-25- 7977
		K2CW/2 W7AW/7	Hudson Wireless Assn West Seattle ARC	930- AB-25- 7935 934- AB-12- 7929 843- A-25- 7821
A		W6WC/6	Klub AR	837- AB-35- 6654
2.35	一下 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	K9AVO/9 W4FHM/4 W2AC/2	Western Electric ARC Bristol ARC. Larkfield ARC	1073- B-17- 6642 910- AB-21- 6354 644- A-22- 6021
A SEARCH		W64E/6 W9HW/9 W3FOX/3	Michigan City ARC	692- AB-12- 5877
		K3NIA/3	Oxford C.rele RC	930- B-18- 5742 861- AB-25- 5727
W3RQZ is th	e snazzy mobile communications center of	W1GLA/1 W4NC/4 K8TKA/8	Framingham RC Winston-Salem ARC	810- AB-22- 5706 903- B-25- 5568 885- B-22- 5460
the Phil-Mont	Mobile Radio Club, hailing out of the	W6AEX/6 W4BFM/4	Soc. of AR Operators Decatur ARC.	831- AB-10- 5454
	area. The Phil-Mont boys were second high bile aggregate scores with 35,020.	W3BN/3 VE2ADX/2	Framingham RC Winston-Salem ARC 20/9 RC Soc of AR Operators Decatur ARC Reading RC South Shore ARC Harrisburg ARC	714- AB-40- 5280 831- B-19- 5178
VII 4114		W3ZEK/3 W9DUP/9	Harrisburg ARC DuPage RC Boulder ARC	584- AB-20- 5034 714- AB-14- 4839
W3BPM/3	(nonclub group) 167- A- 3- 1593	WØEM/9 K4TKC/4 VE3BsQ/3	Jenerson County AREC	730- AB-40- 4701 783- B-22- 4698
WA6DJS/6	El Cajon Valley High	W9AXD/9	ARC. Rockford AR Assn. Waltham AR Assn. Pittsfield ARC. Antletam R Assn. Marina ARC. Dayton AF Depot	757- B-25- 4692 740- B-15- 4590
WSOIT/8 K5EQV/5	Branch Co. RC 248- B 1488	WIMHL/I WIUSS/I	Waltham AR Assn Pittsfield ARC	480- A- 7- 4545 751- B 4506
W9ELJ/9 K5AVT/5 W1TRZ/1	(nonclub group). 1 '9- 4 '5- 5- 1467 Key & Mike ARC. 221- AB-17- 1467 Irving ARC. 219- B- 6- 1454 Tri County ARC. 216-APC- 5- 1446	W3CWC/3 W6CKT/6 W8KP/8	Marina ARC Dayton AF Depot	654- AB-18- 4485 751- AB-26- 4362
K9VHF/9	ARC 167- AB-11- 1440	W6TLO/6	MARS	673- AB-32- 4272 534- AB- 5- 4248
KIOUL/1	ARC of Merrimack Va'- lev 220- AB 1437	W5NW/5 W1SYE/1	Monterey Park ARC Permain Basin ARC Newport County RC	667- B-15- 4152 620- AB-25- 4062
W2ZOT/2 K7NWS/7	Sewanhaka High School ARC	W4MQN/4 W3GV/3 K8RPJ/8	Atlanta RC R Assn. of Erie	636- AB-15- 4008 637- B- 4- 3972
W9WFJ/9	Soc	WA2DNI/2 W0OUI/0	R Assn. of Erie Tri County AR Assn. Monmouth ARC Denver RC	641- BA-51- 3948 412- A-25- 3933 405- A-40 3870
W7EAY/7 W1JT/1	East Providence AR	W8FY/8 K9IND/9	West Suburban VMCA	641- B-20- 3846
K3KXM/3 KØCKP/Ø	Assn	W6VDM/6 W1HGV/1	AR Council (nonclub group) Nashua Mike & Key	616- B-15- 3846 405- A-7- 3645
W5ES/5 K8BPO/8	El Paso ARC	WA6MPA/6	Club	547- AB-21- 3639 436- AB-10- 3534
W9KHW/9 K2MXN/2	Burnington Fhortwave	K3AJT/3	(nonclub group) Susquehanna Valley	436- AB-10- 3534 542- AB-15- 3465
W9YVG/9 K1RKF/1	Eastern H. Hamateurs. 310- BC- 9 1293 Nipmuc Emergency Ra-	W1EUH/1 W6MLK/6	Hi Frequency Amateur	503 AB-12- 3384
W2WUX/2	Uties ARC 207- 8-25- 1242	K6QYB/6	Mobile Soc	507- AB-16- 3339 516- AB- 9- 3285
W9GFD/9 K9UXZ/9		K8TIW/8 K3AGE/3	Oshtemo ARC Foothills RC	340- A-20- 3285
K9UXZ/9 K9DPU/9 K1JMR/1 W#TWU/#	Norwood ARC	W4HFH/4 K4IKF/4 W9RJY/9	Alexandria RC Roanoke Valley ARC Fort Wayne RC	353~ A 3177 502- AB-14- 3120 389- AB-20- 3090
VE3AUS/3 K1NXI/1 K8CHW/8	(nonclub group) 92- A- 4- 1053 Farmington RC 16)- BC- 3- 1020	K8KFP/8 W9BXR/9	Teen Hams of Tolodo	504- B 3024 456- AB-16 3006 471- B-20- 2976
K8GUE/8	Mountain State Trans- mitters	K4VLY/4 W8DSO/8	Mont, Co. AREC Morganton ARC Tireman Big "B" ARC Apple City RC	538-ABC- 7- 2943 485- B-27- 2910
K9TBN/9	Emergency Service R Assn. 139- AB- 8- 1002	W7FD/7 K@OK1/@ K1PBO/1	Kansas City ARC Barustable RC	455- B-15- 2880 455- B-15- 2880
W8QFO/8 WØBXR/Ø	Thunder Bay ARC 164- B 984 Davenport RAC 153- AB- 6- 942	K4ZRY/4 KØVOG/Ø	Council Bluffs Radio	455-ABC-15- 2862 472- B-16- 2832
K6OGR/6 W7UFB/7	Manteca Beer Drinking & Marching Soc 156- B- 6- 936 Casper VHF Soc 123- B- 5- 888	K3KNO/3	Mahanoy Valley Brass	416- AB-20- 2775
W2AVZ/2	Familton Township R	W3LDD/3 W4BBB/4	Pounders Club	433- B-17- 2748 442- B- 6- 2652
VE7WO/7 K2SJO/2 VE3VCD/3	Pt, Grey ARC	W4HOB/4 W9AA/9	RAC of Knoxville	410- B-30- 2610 303- AB-31- 2598 432-ABC-20 2508
K2KHB/2	Sudbury & District 133- B- 798 Brighton High School ARC 99- AB- 6- 789	W9VI/9 W9AML/9	Central Illinois RC	432-ABC-20 2508 460-ABC-20- 2481 384- AB-37- 2436
KØTSW/Ø K5BHF/5	New Ulm RC 106- B- 6- 786	WøQEV/Ø W3CAB/3	Washington Univ. ARC Washington RC Black Hills ARC	356- AB- 8- 2418 238- AB 2412
K9RPM/9	Amateur Club 129- B-12- 774 Oshkosh ARC 122- B-8- 732 Totem ARC 89- AB- 8- 729 Decatur AR Soc. 82- B- 7- 642	WØBLK/Ø WIAEW/I WA2MNQ/2	Pioneer Valley RC Brookside Off-Beat Os-	397- B-21- 2382 374- AB 2289
VE7BQ/7 W9CRM/9 WA2FKK/2	Totem ARC 89- AB- 8- 729 Decatur AR Soc 82- 8- 7- 642 Ogdensburg ARC 2)2-ABC- 8- 621 St. Thomas CD ARC 91- AB- 7- 606	VE2GP/2	(nonclub group)	254- A 2286 271- AB-12- 2247
VE3TCD/3 W8HOP/8	Scioto Valley ARC 321-ABC-12- 561	W6IAC/6 K6QYF/6	Escond do High School	319- AR- 5- 9090
WA2IKN/2 K9HGX/9	(nonclub group)	K7HBA/7 W15RF/1	San Gorgonio Pass ARC Bay Area Radio Klub Quinebaug Valley RC	340- AB- 7- 2232 339- B-10- 2190
K21AP/2 K9UAO/9	AR Soc. of Harrison	W3CWA/3	Monumental RC of Baltimore	310- AB-12- 2163 213- A- 6- 2142
K3JLW/3 K7OBU/7	Carbon ARC	K4FFB/4	Pope AFB MARS Per- sonnel. Gratiot County AR	408- BC- 7 2136
K9TMZ/9 K9ZRD/9		W8NDR/8 K6BAU/6	Assn	347- B-17- 2009
WOCTV/0 WODEQ/9 KIDJH/I	Chicago YLRL 63- AB- 7- 153	K5YEA/5 W9C3R/9	Denton County ARC Wabash Valley AR	290- AB-12- 2061 304- AB-20- 2058
K1HPQ/I	Windham RC	K7CCH/7	Coos County RC	324- AB-30 2055 306- AB-11- 1989 304- B- 5- 1975
W2OYH/2	Morris RC. 1985- A-3)-18,090 Citrus Belt ARC 11/1- A-25-15,453 William Peun RC 1495- A-1 i-13,485	WA2LHM/2 K6HPC/6	Indian Wells Valley	
W6JBT/6 W3TYU/3	William Pean RC	K2REY/2	Jersey City RC	318-ABC 1971 261- AB-14 1941

K8CJS/8 WØYAB/Ø	Old Goats Lee's Summit — C.A.C.		AB	
WØDVL/Ø K9IXS/9	N. E. Iowa AR Assn.	317- 410-	Bc-25-	$\frac{1902}{1872}$
	Elkhart High School	285-	B-22-	1860
K9MVV/9	Duneland AR Assn.  Bangor AREC Communicators RC	272-	AB-34-	1848
WIQAR/I K9ENM/9	Bangor AREC	302-	B- 7-	1812
MILN/	Communicators RC	298- 272-	B-25- AB- 8-	1788 1773
W1LN/1 W9BVM/9	Danvers CD Group Argonne RC	253-	AB-11-	1719
VE2APX/2				
VE5AA/5 W9BFO/9	Jean	259-	AB-25-	
	Ham 302	454-4	ABC-35-	1707
W9ATG/9	Ham Soc. Hancock AR Klub. South Bay AR Soc. Jefferson County ARC. Middlesex AR Soc. Shelter Frances Ba	234-	AB-15-	1695
WA6PDE/6 K9LCA/9	Lefferson County A BC	238-	A-15- AB-13-	1683
W1EDH/1	Middlesex AR Soc.	178-	A-16-	
WIVPU/1			AB-20-	
K2IYU/2	(nonclub group)	183-	AB-12-	1512
W3UEN/3	Assn. (nonclub group)		ABC-12-	
K6DTA/6	West Valley RC Ninth Area RC	249-	B- 6-	1494
WOFOO/9	Ninth Area RC	212-	AB-16-	1446
W9PJ/9	La Crosse RAC	203~	AB-25-	1422
W9PJ/9 K8WNI/8 W8FWG/8	La Crosse RAC Oregon City ARC Copper Country RA	225-	AB-16-	1416
	Assn	234-	B	1404
W5AVT/5	Northwest Louisiana RC	222-	AB- 8-	1380
K2BWK/2	Squaw Island ARC	182-	AB-14-	1359
W21W1/2 W4RKC/4	Albany AR Assn Shenandoah Valley	196-	AB-16-	1323
		278-	BC-16-	1320
KL7AA/KL7	Anchorage ARC	204-	AB-23-	1272
W4KEK/4	Peninsula ARC	300-	BC-13-	1260 1260
WSFT/8	Indiay RC BA	185- 195-	B-10- AB-10-	1254
K7OJI/7	Lebanon Valley Soc. RA Treasure Valley R Assn.	160-	AB- 7-	1197
KL7AA/KL7 W4KEK/4 W8FF/8 W3EIA/3 K7OJI/7 W6LHY/6	(nonclub group)	148-	AB- 7- AB- 5-	1029
	(nonclub group) Kans,-Nebr. RC Lockheed ARC	186-	BC-16- BC-11-	999
W6LS/6	Spud Pickers AR Klub. Winslow AR Soc	173-A	BC-II-	987
KIPDV/1 K9MRL/9 VE4HE/4	Winslow AR Soc.	420-	B- 4- B- 7-	840
VE4HE/4	Winnipeg ARC	111-	AB-10-	837
KØSIC/Ø K8LUC/8		199-	BC-22-	831
K8LUC/8	Evendale ARC. East Penn RC	132- 262-	AB- 8- AB- 3-	790
W3QQB/3 K9NBK/9	Naval Avionics Facility	202-	AD- 3-	585
	RC (nonclub group)		BC- 8-	492
WITCF/1		42-		402
	ransmitter: Operated Simi			
W2YKQ/2 W48KH/4	Lake Success RC Oak Ridge Radio Op-		A-20-1	
	erators Club Indian H lls RC	1384-	AB-30 1	1.121
W8ICS/8 W4PLB/4	Indian H lis RC	1504-	AB-38- AB-25	9786
K8AIR/8	Orlando ARC Amateur MARS Com-	1002-	AB-20	9204
	municator Cub Montrose & Deita	1161-	AB-52-	9171
KØQMH/Ø	Counties ARCs	946-	A-27-	8514
W3BTN/3		1089-	AB-32-	8385
W1ECO/1		891-	A-30-	8244
W1ECO/1 W4NVU/4 K4BEM/4	Dade RC Atlanta Soc. of Teenage	912-	A-20-	8208
	R Ops	896-	AB-16-	7764 7713
K3HKK/3	R Ops Nittany ARC Hamden AR Assn. Schenectady AR Assn.	899-	AB-35-	7713
WIWHP/I	Schenegtedy AP Agen	1218-	AB-23- B-35	7641
W1WHF/1 K2AE/2 W6AIL/6		1180*	D=30	7260
W2ZQ/2	Delaware Valley R	742-	A= 6=	6903
	Assn. Calgary AR Assn.	737-	A	6633
VE6NQ/6	Newport AP Soc	976- 683-	AB-27- A-34-	6537
W6DNA/6 W2UW/2	Newport AR Soc Mohawk RC		AB-12-	6372
VE3JJ/3 VE3DC/3	Mohawk RC	635-	A-20-	5985
VE3DC/3	Hamilton ARC	656-	A-27-	5904
W8RX/8	South Eastern Michigan AR Assn	755-	AB-25-	RREG
	CARL CLOSEL	100"	AD-20-	0008



#### November 1961



W2IMB/2	The Cornet	906- B-18- 5586
W2QYV/2	The Garnet Niagara RC Oakland RC Indianapolis RC Huntsville ARC North Hills RC Nutley AR Soc	906- B-18- 5586 659- AB-30- 5067
W2QYV/2 W6OT/6 W9JP/9	Oakland RC	538- A 20- 5067
W9JP/9	Indianapolis RC	760- AB-15- 5046
K4IKR/4	Huntsville ARC	816- B-15- 5046
K6QWL/6	North Hills RC	571~ AB-12- 4821
W3MAT/2	Deschool Character A There	000- Wris-10- 1008
W2GLQ/2 W3MAT/3 W1YQF/1	Towkshipy AR Asen	785- B-30- 4710 704- AB- 4671
K9TSM/9	Tewksbury AR Assn. Goshen ARC. Kerrville RC.	724- AB-16- 4548
WSTH/5	Kerrville RC	738- B-18- 4428
KIBCI/I W4MIK/4	CQ RC	679- AB-22- 4386
W4MIK/4	CQ RC Ole Virginia Hams Mount Diablo ARC	721- AB-18- 4359
W6CX/6 K3GFW/3	Mount Diable ARC	450- A-24- 4293
RJGF W/J	Cumberland Vailey Five Towns RC Muskogee ARC Falo Alto AR Assn. Seenera RC Exeter AR Soc. Sacramento ARC Metro ARC Egin AR Soc Toledo Mobile R Assn. Blue Ridge R Soc.	462- A-17- 4158
K2MQW/2	Five Towns RC	579- AB-25- 4140
K5LRU/5	Muskogee ARC	619- AB-28- 4080
W6OTX/6	Palo Alto AR Assn	627- AB-24 3984 621-ABC-18- 3855
K5LRU/5 W6O f X/6 W8ID/8 K1OUR/1	Senera RC	621-ABC-18- 3855
W6AK/6	Exeter AR Soc	548- AB-25- 3822
VE3MRC/3	Merro ARC	486- AB-17- 3762 474- AB-20- 3759
W4SRX/4	Egiin AR Soc	534- AB-15- 3690
W4SRX/4 W8HHF/8	Toledo Mobile R Assn.	376- AB- 8- 3468
W4NYK/4	Blue Ridge R Soc	519- B-15- 3264
VE3AIS/3	Oakville ARC Lake-Geauga ARC Edison Employees AR	337~ A 20~ 3258
W8RNF/8 K8SUL/8	Lake-Geauga ARC	528- AB 10- 3198
MOSC L/O	Soc Employees AR	430- AB- 8- 3168
W5RIN/5	Soc. Beaumont ARC	443- AB-17- 2913
K8YOI/8	Blennerhassett ARC	483- B-17- 2898
K3BKG/3 VE3CBC/3	Beaumont ARC Blennerhassett ARC Chester County ARC	513-ABC-14- 2802
VE3CBC/3	CBC ARC. Corpus Christi ARC.	358- AB-10- 2870
W5MS/5 W3CSL/3	Monessen ARC	453- AB-12- 2739
W2SEX/2	AR Assn. of the Ton-	417- AB-15- 2703
	awandas Horseshoe RC. Lehigh Valley ARC. Marietta ARC	404- AB-38- 2679
W3QZF/3	Horseshoe RC	571-ABC 2667
W3O1/3	Lehigh Valley ARC	567-ABC-15- 2520
W8HH/8 W5ND/5	Marietta ARC	403- AB-25- 2481
W8QQQ/8	Orange ARC	387- AB-18- 2361 335- AB 2232
K4FGF/4	Base Organized MARS	335- AB 2232
	ARC Bedford RC	400- BC-13- 2196
KIGAY/1	Bedford RC	408-ABC-10- 2142
W8FO/8 W1NEM/1		427-ABC-15- 2115
WINEMI	Hartford County AR	228- A- 6- 2052
KØYAX/Ø	Three Rivers Ham Club	228- A- 6- 2052 310- B-12- 2010
K8DAC/8	Saginaw Valley ARC	256- B-10- 1536
K8DAC/8 WA2GAN/2	Chaminade Explorers	113- B-21- 678
Str T	ransmitters Operated Simu	
K2AA/2	South Jersey Radio	and the same of
	Assn.	1985- AB-75-17,774
W2WW/2	Watchung Valley RC	1201- A-31-11.034
W98W/9	Assn	
KOAVE/O	Assn Iltinois Valley R Assn	1109- AB-28- 9465
K9AVE/9 W8ACW/8	Concess County DC	953- A-21- 8802
K6QEZ/6 WA2LQO/2	Genesee County RC	1236- AB-85- 7854 1224- AB-35- 7731
WA2LQO/2	Ampex ARC	1029- AB-36- 7062
KIBKE/I W9DUA/9 W6WWJ/6	Contoocook Valley RC.	721- A-11- 6723
W9DUA/9	Sangamon Valley RC.	875- AB 20- 5688
K6LSZ/6	Sidowindow DC.	765- AB-25- 5559
W#ERG/#	Contoocook Valley RC. Sangamon Valley RC. South County AR Soc. Sidewinders RC. Sidewinders RC. Sidewinders RC.	809- AB-22- 5277 824- AB-35- 5184
VE3VM/3 W8HTX/8		824- AB-35- 5184 612- AE-23- 5172
W8HTX/8	Heath ARC	782- AB-16- 4965
WA6ODP/6	Heath ARC. Livermore AR Klub	571- AB-22- 4632



K2TIO/2 W9ARA/9 W4U2S/4 K6SIR/6 W3AVK/3 W9KN/9 K9CJU/9 W6UCS/6 W6LWN/6 W6EXN/6 K6EAG/6 W8APY/8	Englewood AREC Bloomington ARC Panama City ARC Rumons RC West dranch AR Assn. Delaware Valley ARC Eigin AR So. RA Megacycle Soc. Montercy Bay RC San Mateo RC Turlock ARC Hayward RC Champaign County	567- 584- 498- 526- 416-	A-26- AB-25- B-10- AB-18- AB-22- AB-25- AB-15- AB-15- AB-15- AB-15- BC-15- B	3771 3705 3516 3267 3063
K6HAI/6 W4WYX/4 K7KRR/7 W9BLW/9 K2IOC/2 W2KVG/2	ARC. North Shores ARC. (nonclub group) Mount Erie RC. Flambeau ARC. Central Queens RC. Tryion RC.	388- 327- 293- 387- 490-	B- 8- AB- 8- B- 9- AB- 6- AB-12- AB-14-	2466 2448 1962 1782 1671 1421 1199
Seven	Transmitters Operated Simi	ultaneo	usly	
VE3DOH/3 W6PW/6 W6ULI/6 VE3ZM/3 W6SD/6 K3IVO/3 W9SWQ/9 WA2NGI/2 VE3KCD/3	Windsor ARC San Francisco RC Fullerton RC Guelph ARC San Fernando Valley RC Free State ARC Four Lakes ARC Gloucester County RC Kitche ner-Waterloo	864- 719- 976- 879- 884- 918-	AB-49- AB-25- AB- 9- A AB-30- AB-22- AB-45- AB-27- AB-27-	7095 6471 6234 6177 5964 5940
W4GAC/4 W6PMI/6 K9GXU/9 WA2OII/2	ARC St. Petersburg ARC United RAC St. Clair ARC Apple Pie Hill AR Assn.	735- 658- 580-	B-30- AB-12- AB-27- AB-22-	4410 4233 3576 3360
	Transmitters Operated Sim	ultaneo	usly	
W9FQ/9 W8HLD/8 W6PMK/6 KØDWC/Ø W9CEQ/9	Wheaton Community RA. Catalpa AR Soc. North Peninsula Elec- tronics Club Believue ARC. Fox River R League.	1408- 1117- 913- 921- 873-	B-43- B-30- AB-25- B-12- AB-16-	
W4PAR/4 W2MDM/2	Davidson ARC (nonclub group)		AB-20- B-25-	3846
				2002
	Transmitters Operated Simi			
W2G8A/2 K2YCJ/2	Garden State AR Assn Communications Clu of New Rochelle	b		
K2USA/2 W6LYM/6 W2US/2 W9YH/9 W9UV1/9 W9ADZ/9 W4MOE/4	Fort Monmouth ARC. The Corona Gang. Suffolk County RC. Twin City ARC. Peorla Area ARC. Chain of Lakes ARC. Buncombe County ARC	1593-/ 839- 838- 991-/ 867- 719-	ABC-45- A-12- AB-26- ABC-29- B AB-35- AB-17-	8949 7794 5973

1 1			
100			

Ten Transmitters Operated Simultaneously

Eleven Transmitters Operated Simultaneously

Valley ARC ... 3348 - A-68-30,357
Associated RA of Long
Beach ... 2021- AB-40-13,023
Scarboro ABC ... 1325- A-31-12,150
Nortown ARC ... 1689- AB-40-11,457
Northwest ARC ... 1157- AB--10,338
Lower Columbia AR
Assn ... 906- AB-35- 7908

RC of Tacoma...... 2545- A-60-23,130

This big beam overshadows the picturesque view of the K-W Club Field Day site, W7DTT/7.

W2LI/2 W5SC/5 W2GIZ/2	Tri County R Assn 2535- A-45-23,040 San Antonio RC 2117- AB-50-15,783 Union County AR Assn. 505- AB-21- 3357
Twelve	Transmitters Operated Simultaneously
W3RCN/3	Rock Creek AR Assn 2165- AB-110-16,749

#### CLASS B

Grouped in this listing are the scores of portable stations manned by one or two operators. Where two persons participated, the call of the other operator (if known) is given below that of the amateur whose call was used. Figures following the calls indicate number of contacts, power and final score.

One Transmitter
**********
W2FBA/2 W2JBQ443- A-6318
W3YDF/3519- A-5153
W3DQG/3 858-AB-5019
W5YJS/5 W5NCN353- A-4766
W6BAM/6413- A-3942
W8VWY/8222- A-3335
W3HEC/3
W3 LN W9 FOR/9
W9OHG 510- B-3060
W6ANB/6 312-AB-2778
W5SGA/5460- B-2772 W5YFN VE7FF/7274- A-2691
K2VZJ 396- B-2508
WIWAI/I)
K4LDR/4
WA2DPT/2
KH6DQA/KH6   227 D 2170
KØJIH KØJFL/Ø \ 235- A-2115
KØBZP230- A-2115 K4WOI/4207- A-2088
KN308V/3 }125- A-2025
KN30IO  125- A-2025 K5UTV/5  315- B-1890 W6NKR/6  209- A-1881
W6NKR/6 K6ZPE }209- A-1881 K8PZM/8 K8JIC }283- B-1848 K8JIC 193- A-1737
W9ZHD/9) oog Diric
W9VWM K3KHK/3125- A-1688 K4VSA/4 K4WIP K4WIP
K2PSR230-AB-1566
W6MSM/6109- A-1472 K5WUE/5244- B-1464
K9UKO/9)
K90YD W7WXI/7 K7AZH129- A-1386
W7WXI/7 K7AZH W1FKJ/1 W1NXX
K@GEY/673~ A-1323
W1ALL/1 W1VNX K4EOS/4 \ 214- B-1284
KARVT
KØAQO/Ø 208- B-1248
WA6MWA/6 3 .207- B-1242
W5PTK/5 K54ZJ 201- B-1206
W9EDO/9 K9E Y222- A-1998
W6CIS/661- A-1161 K6ORC/6)
K5YAA/5
W4SNII /7 117- 4-1052
W5ESW/5170- B-1020
K6QFS/667- A- 905
KATYK 100- A- 900
W1GPY/1
K1GDX  62- A- 837
K4 · EI/4 62- A- 837 W1MBR/1 W1LNI 108- B- 798

K8QPY/888- A- 792
K8QPY/8 W8RHV W9MAK/9 W9ADO129- B- 774
W2THI1/2 ) on a mea
WA2JYK  86- A- 774 K1LPC/1  126- B- 756
KIGVO   120" D" 100
W8881.   No A- 720
K8PTK/8 K8OGO80- A- 720
W9OHU/926- A- 689
K21 SF /2 75. A - 67c
TRUTT A NURT (T)
K7IOA79- B- 636 WA6HRS/6 105 B 630
K7JMN       34- A- 531         W8 ΓΚΥ/8       229-AB- 515         W8MNV       56- A- 504         WθOHM/θ       65- B- 480
W8MNV }229-AB- 515 K7DUF/656- A- 504
WØOHM/Ø }65- B- 480
W2UJS/223- A- 432
K5HXO/5 K5LDQ46- B- 426
WA6JMQ/6111- B 420 WA2GWS/246- A- 414
W6IAH/6 \ 29 A- 392 K1ITU/1 128- C- 384 K2EKS/2 175- B- 350 K8SHQ/8 \ 173- B- 346
K2EKS/2175- B- 350 K8SHQ/8)
KINFD/190-AB- 343
K1BZB/1 K1BII KN3ONW 35- A- 315
KOORE/7 104- 4- 315
KØCFY/Ø 312
KØTDL/Ø395- C- 285
K1LNC/1180- B- 260
$     \begin{array}{c}         \left\{ \begin{array}{c}             \text{K}\theta\text{VAE}/\theta \\             \text{K}\theta\text{VAF} \\             \text{WA2THG}/2 \\             \text{WA2PRD}     \end{array} \right\} \dots 39- B- 234 $
WA2PRD   B- 234 K5CDC/5107- B 214
KØQHF/KP451- B- 212
WV2PDE/2 WV2QDZ22- A- 198
K4QET/4 K4IUB22- A- 198
WA2THG/2 WA2PRD \39- B- 234 K5CDC/5 107- B 214 K9QHF/KP451- B- 212 WV2PDE/2 WV2QDD \22- A- 198 K4QET/4 K4UB22- A- 198 K9CGK/932- B- 192
WOMDM (9)
WA2EWB \88-AB- 178 K9UMO/726- A- 156
K1RGO/113- A- 117
WA6AWD/013- A-117 W4YOX/436- B- 72
K7IVJ }11- B- 66 K6HJU/9 7- A- 63 WA6OLQ/69- B- 54
WA60LQ/69- B- 54 KN1RIH/116- A- 48
W1BB/123- B- 46
KN4NYO15- B- 30
K6HJU/9 . 7- A- 63 WA60LQ/6 .9- B- 54 KN1RIH/1 16- A- 48 WBB/1 .23- B- 46 W4CDA/4 .15- B- 30 KN9FNB/9 .2- A- 18 K6YPV/5 .6- B- 12 K9BNW/9 .2- B- 6
K5YPV/56- B- 12 KØBNW/92- B- 6
Two Transmitters
WA6JDL/64422- B-2622 K4YNO/4\207- A-1863
K4ZRH
KØLFF/Ø284- B-1854 KØCDG
W7GUS/7 \ 135-AB- 915
W7BJW KP4AQY/KP4   375- B- 800
KP4ATV
WA2EOP
K1JBS/1 125. C. 276
KINOM   KNØCMF/Ø  19- B- 114 KNØHNE
KNØHNE   K3NFM/3  12- A- 108   K3ATI
K3ATI /

W7HZ/7 W6PMO/6 VE3WE/3 VE3NAR/3 W9RK/9 W7NCW/7

W7DK/7



Quite a few clubs tried balloons for supporting antennas with varying success. Here the Old Goats of Temperance. Mich., K8CJS/8, attempt to launch a six-meter halo. Happy landing!

### CLASS C

Grouped in this tabulation are the scores of entrants in the mobile class. Figures following the call indicate number of contacts, power and final score.

W6QYY/63			
	000 . 4700	THE A GREEN AND	
	322-A-4700	WA6HGH/6	65-B-1728
KAUKH/A	162-A-3902	K6VYV/6	64-R-1719
ECODD DAY	161-A-3888	K6VYV/6 K3GNM/3	100 . 1000
ROKKD/O	101-A-0000	RaGNM/3	100-A-1088
WA6GIT/6.	127-A-3429 118-A-3308	W8SDV/8 K6PXH/6	71-A-1648
WR. IND/R	118-4-3308	KEPVII	05 4-1620
WUGELL O		ALGE ALLE O	90-4-1020
W6GTG/6	114-A-3267	W3VXN/3	94-A-1607
WARLGAR	216-4-3254	W9NIO/9	95-4-1495
TELEGRACIES (C.	216-A-3254 105-A-3159	WOONN C	
WAGDGH/6.	105-A-3139	K60XX/6	85-A-1480
WEOPY/6	10 FA-3092	W8MWE/8	57-4-1472
TF0 22 27 70	99-A-3078	1112COME /2	70 . 1421
MOUVE/O		W3GOW/3 K3HIJ/3	(9-A-1401
WAKTB/6	92-A-2957	K3HIJ/3	87-4-1418
		W3YHV/3	70 1-1404
Rott O/O	89-A-2916 183-A-2889 86-A-2876	Walliv/a	(8-A-1404
W6QPX/6	89-A-2916	W8OHA/8	41-A-1350
WEDOD'S	183-4-2889	W6VHU/6	04-1-1260
WOLCH!	00 . 0070	TETO A PER 10	
W6CXD/6	85-A-28/0	W8AJH/8	34-A-1250
		W8ZJQ/8	34- 4-1256
111 + COD 17 / C	79-A-2781	EGITATID /O	24 1 1956
WAGURZ/O	19-A-4101	K8UNP/8 W8NOX/8	34~A~1200
WAGOXZ/6	79-A-2781	W8NOX/8	32-A-1202
L'CD III /6	79-A-2781 79-A-2781	K6IQA/6	80 4-1202
DODG C/U		THE COURT OF	
K6UML/6	79-A-2754 77-A-2754 74-A-2713 72-A-2686 71-A-2673 139-A-2673 67-A-2619	W600R/6	64-A-1202
WASTUL/S	74-4-2713	W3LNQ/3	61-4-1161
WAGATA O	70 1-2696	WOLLCO	50 - 1194
WADIQE O.	12-A-2000	K9LJC/9	38-A-1134
KELIC/6	71-A-2673	W9AYU/9	59-A-1134
WOOTEO 193	120 4-2673	K8PZQ/9	67 4-1107
Wagno/a	100-14-2010	1801 200/ 3	
WASOXX/6.	67-A-2019	K9MNF/9 VE3DDB/W6	46-A-1094
		VE3DDB/W6	81-4-1094
ENGLE LY G.	62-A-2552	W3NIP/3	50 . 1004
WAGAAZ/O.	02-A-2002	WONIF/O	00-A-1094
KELTO/6	62-A-2552	WAGIDV/6	52-A-1040
SCOUNT 10	62-A-2552	WA6IDV/6 W3PWG/3	51-A-1026
NOSDL/0	0.000	THOSE W CI/O	31-3-1020
K5TPT/6	62-A-2552	W9MYI/9	51-A-1020
WAVII./A	57-1-2484	K6CAJ/6	76-4-1026
ILU I GLI O	57-A-2484	K6CAJ/6 W9QAX/9	F4 + T 000
K6JNV/6	0/-A-4404	WSQAA/9	54-A B- 903
		K3FBO/33	105-B- 945
THE A CETTER /C	EE 4-9457	W3AJO/3	49 4 019
W AOJJU/O	33-A-2401	World O/ a	43-A- 310
K3M EB/6	53-A-243U	WOSEE/O	67-A- 905
K3MEB/6	55-A-2457 53-A-2430	WOSKE/O	67-A- 905
		W6DUY/6	
WAGMSZ/6	52-A-2417	W6DUY/6 W3VVS/3	39-A- 864 37-A- 837
WA6MSZ/6 WA6NDL/6	52-A-2417 51-A-2403	W6DUY/6 W3VVS/3 W5QF/5	39-A- 864 37-A- 837 93-B- 837
WA6MSZ/6 WA6NDL/6	52-A-2417 51-A-2403	W6DUY/6 W3VVS/3 W5QF/5	39-A- 864 37-A- 837 93-B- 837
WA6MSZ/6 WA6MSZ/6 WA6NDL/6	52-A-2417 52-A-2417 51-A-2403	W6DUY/6 W3VV8/3 W5QF/5	39-A- 864 37-A- 837 93-B- 837
WA6MSZ/6 WA6NDL/6 WA6BVI/6	52-A-2417 52-A-2417 51-A-2403 51-A-2390	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837
WA6MSZ/6. WA6NDL/6. WA6BVI/6. K6GUU/6.	52-A-2417 52-A-2417 51-A-2403 51-A-2390 49-A-2376	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837
WA6MSZ/6. WA6NDL/6. WA6BVI/6. K6GUU/6.	52-A-2417 52-A-2417 51-A-2403 51-A-2390 49-A-2376	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837
K6SWZ/6. WA6MSZ/6. WA6NDL/6. WA6BVI/6. K6GUU/6. WA6GIS/6.	52-A-2417 52-A-2417 51-A-2403 51-A-2390 49-A-2376	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9	. 39-A- 864 . 37-A- 837 . 93-B- 837 . 37-A- 837 . 61-A- 824 . 35-A- 810
K6SWZ/6. WA6MSZ/6. WA6NDL/6. WA6BVI/6. K6GUU/6. WA6GIS/6. WA6JUO/6.	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810
K6SWZ/6. WA6MSZ/6. WA6NDL/6. WA6BVI/6. K6GUU/6. WA6GIS/6. WA6JUO/6.	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3PST/3	39-A- 864 37-A- 837 33-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810 34-A- 797
K6SWZ/6 WA6MSZ/6 WA6NDL/6 WA6BVI/6 K6GUU/6 WA6GIS/6 WA6JUO/6 WA6JUO/6 WA6JTA/6	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376 49-A-2376 15)-A-2363	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3PST/3	39-A- 864 37-A- 837 33-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810 34-A- 797
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K6SWZ/6 WA6MSZ/6 WA6NDL/6 WA6BVI/6 K6GUU/6 WA6GIS/6 WA6JUO/6 WA6JUO/6 WA6JTA/6	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376 49-A-2376 15)-A-2363	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3PST/3	39-A- 864 37-A- 837 33-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810 34-A- 797
K6SWZ/6 WA6MSZ/6 WA6NDL/6 WA6BVI/6 K6GUU/6 WA6GIS/6 WA6JUO/6 WA6JUO/6 WA6JTA/6	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376 49-A-2376 15)-A-2363	W6DUY/6 W3VV8/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3PST/3 W3EQV/3 K3DJE/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810 34-A- 797 33-A- 783 61-B- 774
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K6SWZ/6 WA6MSZ/6 WA6NDL/6 WA6BVI/6 K6GUU/6 WA6GIS/6 WA6JUO/6 WA6JUO/6 WA6JTA/6	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376 49-A-2376 15)-A-2363	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3FST/3 W3EQV/3 K3DJE/3 W3AK/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837 61-A- 824 35-A- 810 60-A- 810 34-A- 797 33-A- 783 61-B- 774
K6SWZ/6 WA6MSZ/6 WA6NDL/6 WA6BVI/6 K6GUU/6 WA6GIS/6 WA6JUO/6 WA6JUO/6 WA6JTA/6	52-A-2417 52-A-2417 51-A-2403 51-A-2403 51-A-2390 49-A-2376 49-A-2376 49-A-2376 15)-A-2363	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/3 W2DLT/2 K3GBA/3 K9PKW/9 W3FWI/3 W3F9T/3 W3EQV/3 K3DJE/3 W3LDJE/3	39-A- 864 37-A- 837 93-B- 837 37-A- 837 61-A- 824 35-A- 810 34-A- 797 33-A- 783 61-B- 774 67-B- 765 83-B- 747
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KOSWZ/6 WA6NSZ/6 WA6NDL/6 WA6NDL/6 KEGUU/6 WA6IU/6 WA6IU/6 WA6IU/6 WA6ITA/6 WA5UU/6 K6RU/6 WACKE/6 WAC	32-A-2417 31-A-2403 31-A-2403 31-A-2390 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2378 48-A-2363 48-A-2	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/2 W3YJM/2 K3GBA/3 K9PKW/9 W3FWI/3 W3PSI/3 W3PSI/3 W3PSI/3 W3PSI/3 W3AK/3 W3AK/3 W6MEG/6 W3SAA/3 W9OGZ/9 K9UYU/9 W3LEM/3 WA6CYF/6 W3FOG/3 K6DJO/6 K5MOT/5	39-A 864 3 - A 837 93-B 837 37-A 824 35-A 824 35-A 824 35-A 824 33-A 783 33-A 783 33-A 783 33-A 783 33-A 783 33-A 783 33-A 783 33-A 783 34-A 797 34-A
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KOSWZ/6 WA6NSZ/6 WA6NDL/6 WA6NDL/6 KEGUU/6 WA6IU/6 WA6IU/6 WA6IU/6 WA6ITA/6 WA5UU/6 K6RU/6 WACKE/6 WAC	32-A-2417 31-A-2403 31-A-2403 31-A-2390 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2378 48-A-2363 48-A-2	W6DUY/6 W3VVS/3 W5QF/5 W3YJM/2 W3YJM/2 W3YJM/2 W3YST/3 W3PST/3 W3PST/3 W3PST/3 W3LID/2 W2LID/2 W2LID/2 W5MEQ/6 W9OGZ/9 W9UYU/9 W3LEM/3 W4GCYP/6 W3FOG/3 K6DJO/6 K6VJT/6 K6VJT/6 K6VJT/6 K6VJT/6 K6VJT/6	39-A - 864 3 - A - 837 93-B - 837 37-A - 837 6 - A - 820 60-A - 810 34-A - 797 33-A - 783 33-A - 783 33-A - 783 33-A - 783 33-A - 783 33-A - 783 40-B - 764 61-B - 765 55-A - 729 29-A - 729 29-A - 729 29-A - 688 49-A - 662 21-A - 662 21-A - 662 21-A - 662 21-A - 668
KOSWZ/6 WA6MSZ/6 WA6MSZ/6 WA6MSZ/6 WA6MSZ/6 WA6MSZ/6 WA6JU/6 WAFU/6 WAFU/6 WAFU/6 WAFU/6 WAFU/6 WAFU/6 WASWU/8 WA6JU/6	32-A-2417 51-A-2473 51-A-2473 51-A-2473 51-A-2390 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 49-A-2376 10-A-248 47-A-2449 46-A-2335 110-A-2268 111-A-2268 111-A-2268 111-A-2268 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-248 111-A-1954 111-A-19	W6DUY/6 W3VVS/3 W5QF/5 W5QF/5 W5QF/5 W2DLT/2 K3GBA/3 K9PKW/9 W3FSI/3 W3PSI/3 W3PSI/3 W3AK/3 W2LID/2 W6MEG/6 W3SAA/3 W9OGZ/9 K9UYU/9 W46CYF/6 W3FOG/3 K6DU/6 K6VIF/6 K5MQT/5 W3CDH/3 W3CDH/3 W3CDH/3	39-A 864 37-A 867 93-B 837 37-B 837 37-B 837 37-B 837 37-B 837 37-B 837 37-B 837 37-B 837 37-B 837 38-A 783 38-A 7
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W3QQH/317-A- 567	K4YCL/412-A- 162
W9GQY/9741-A-554	W3ADV/318-E- 162
VEINZ/1	K4DYW/417-1- 153
KØOFM/Ø8 33-E- 522	K3JOY/117-F - 153
W6GDO/636-A-486	E STITUTE 11 4 140
	K5VUX/511-A- 149
K5UOD/53 52-B- 468	K4JQO/415 135
W3DJV/39-A- 459	K4RDT/49-A- 122
W31WO/334-A- 459	K8LCC/89-A- 122
K8LOS/88-A- 446	K9BAY/913-E- 117
K8SKL/833-A- 446	K8YYK/88-A- 108
W3UMK/323-B- 432	WØBPO/311-B- 99
WA6AJI/632-A- 432	KØMUL/Ø
VE2IK/24-A- 432	W6BUK/67-A- 95
K3AKR/3 22-B- 423	KSQZV/87-A- 95
K9IVX/95-A- 405	K3EZJ/310-B- 90
Kerpyle 93 AD 956	WA2THG/2 6-A- 81
K8ERZ/833-AB-356	
K6TYJ/61-A- 351	K4WYR/48-B- 72
W6EPG/6 1-A- 351	KSUFW/8 5-A- 68
W3JYA/323-A- 311	K8IIU/85-A- 68
K6ICS/632-B- 288	K8RHN/84-A- 54
W3JPP/35-B- 270	K8TAU/83-A- 41
VE1KK/126-B- 234	WA2CCF/21-A- 27
W3HFD/321-P- 189	K4ACZ/43-B- 27
W4MBO/621-B- 189	K8VKE/8 2-A- 27
K10PY/13 13-A- 176	DOT BEING - 2"A" 21

### CLASS D

Grouped in this tabulation are the scores of home stations operated from emergency power.

W9JMN° 245, W9VMW° 175, K2TNO° 169, W4CB/4 °° 125, W9BBF °° 121, K9SRR 73, W0JLY 48, W1MRQ 44, W9BSO° 38, W1BNB 22, WØKLG °° 21, WØFDM 6, W9ON1

#### CLASS E

Grouped in this tabulation are the scores of home stations oper ted from commercial power sources.

OPET 14 d from commercial power sources.

WSFAW 400. W3SZ II 336. WA6NNJ 290. WA6DBC 234. WA6IRN 228. K10BA/1 228. W4YE 215. K80CO 215. K80CO

<sup>1</sup> K6QHZ, K6EXO oprs. <sup>2</sup> K7JWA, K7MTJ oprs. <sup>3</sup> 2 oprs. <sup>4</sup> K68DR, Wa6DMM oprs. <sup>5</sup> 2 rigs. WA6QYY, K6PXH, K6DXX oprs. <sup>5</sup> 2 rigs. <sup>3</sup> 2 rigs. WA6QYY, K6PXH, K6ENC oprs. <sup>5</sup> 8 pors. <sup>3</sup> W9GQY, W9TBZ oprs. <sup>5</sup> K9DFX oprs. <sup>5</sup> 5 oprs. <sup>14</sup> S9YGM, K9UJ oprs. <sup>19</sup> 2 rigs. <sup>5</sup> oprs. <sup>14</sup> S9YGM, K9UJ oprs. <sup>19</sup> W9KLG, K9CHB oprs. <sup>19</sup> 2 rigs. <sup>5</sup> tigs. 10 oprs. <sup>18</sup> K8FCZ, K5DHT oprs. <sup>18</sup> K1LOM, KNIQNE oprs. <sup>19</sup> WWPR opr. <sup>7</sup> YK2OSA, WA2JEL oprs. <sup>18</sup> 2 rigs. <sup>4</sup> oprs. <sup>19</sup> 2 rigs. <sup>3</sup> oprs. <sup>19</sup> K15SKLE oprs.

ARRL thanks the following annatures for submitting the logs for checking purposes: 10.25 GHO KYS NGC PDG, 75 YNL ZYR, W3LNO, 10.45 EOT LUV TS, WGUWL, KYAD W7ESM, WSFX, W9YDP, VESs CYR EIG, VE7s BB ASC, ZLIAHY.

## A-Strays 3

Here's the November schedule for the Air Force MARS Eastern Technical Net, meeting Sundays at 1900 GMT on 3295, 7540, and 15,715 kc.

Nov. 5 — Introduction to Sonar.

Nov. 12 — Underwater Communications.

Nov. 19 — Modern Submarines.

Nov. 26 — Oceanography.

# A Method for Determining V.H.F. Station Capabilities

Using Readily Obtainable Data to Plot Reliable Range

BY D. W. BRAY,\* K2LMG

If you have ever wondered about the maximum distance that could be worked by your v.h.f. station under normal propagation conditions, you probably decided that to determine the answer would be a sizable task. There is a great deal of literature on the subject, but much of it is too theoretical for the practical person. Then, even if an answer is obtained, you still may question whether it is just a theoretical number or the right answer.

After reading a recently published paper on ground wave and tropospheric scatter propagation. I became interested to see if the answers that the theory predicted held true for an amateur radio station, where the antenna site and many other factors were not optimum. After running schedules over a period of months with K2GQI and W4LTU, I found that the measured signal strength checked with predicted signal levels within the limit of accuracy of my measuring equipment. Since the theory seemed to hold for amateur radio stations, other v.h.f. enthusiasts may be interested in having a relatively simple method of calculating the working range of their stations. Some might be surprised at how far they should be able to work. Such information is also useful to determine what station changes should be made to work a station that is presently just out of reach of reliable communications.

\* Advanced Electronics Center, General Electric Comany, Ithaca, N. Y.

1 Norton, "System Loss in Radio Wave Propagation," Journal of Research of the National Bureau of Standards, July-August, 1959.

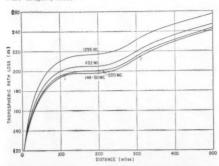


Fig. 1 — Path loss vs. distance for amateur frequencies above 50 Mc. Values indicated are those that the path loss will be equal to, or less than, for 99 per cent of the hours of the year. This curve should be used for extreme reliability requirements.

In order to make the calculation as straightforward as possible, data and graphs given by Norton have been reduced to nomogram form for the amateur frequencies from 50 to 1300 Mc. Before we get into the method of calculation, however, a few interesting things can be determined by plotting the path loss as a function of distance. The path loss is the loss in signal over the distance between two stations. It is expressed as a decibel loss and is the ratio of the power transmitted by one station, using an antenna with a gain of 1, to the power received by another station, also using an antenna with a gain of 1. Mathematically this is expressed as:

Path Loss in db. = 
$$10 \log \frac{\text{Power Transmitted}}{\text{Power Received}}$$

In order to communicate, the path loss must be overcome by receiver sensitivity, antenna gain, and transmitted power. The path loss is not constant, but is the expected value which it will be equal to or less than, for a given number of hours of the year. If the path loss is given for 99 per cent of the hours of the year, then for a particular distance between stations the path loss will be equal to or less than that value 99 per cent of the hours of the year. Such a graph of path loss vs. distance is shown in Fig. 1. Fig. 2 is a similar graph plotted for a path loss equal to or less than the given amount 50 per cent of the hours of the year.

The first thing to be noted from the graphs is that the signal loss between two stations on the earth is anything but a straight line as the distance is increased. At first, the path loss increases rapidly as the distance becomes greater, then it tends to level out and again rise, but not as steeply as the original change of path loss. This is particularly true of the graph for 99 per cent of the hours of the year. This means that for a given increase in power or antenna gain, the benefit which can be achieved depends on the distance to the station that is receiving you.

As an example, assume there is a low-power 2-meter station which can reliably work a similar station 60 miles away. Referring to Fig. 1 (99 per cent of the hours of the year), it can be seen that the path loss for 60 miles is about 180 db. If the station transmitted power is raised from 6 watts to 60 watts, the station can now be heard reliably 90 miles away, since the 10-db. increase in power will overcome 10 db. of path loss, increasing allowable path loss from 180 to 190 db. However, for an increase in power of 10 times, the

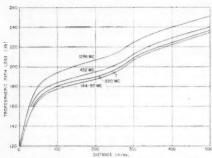


Fig. 2—Path loss vs. distance for 50 per cent of the hours of the year.

distance worked is only increased by 1.5 times. Making another increase in power of 10 db., thus raising the transmitted power from 60 to 600 watts, the allowable path loss is 200 db. and the working distance 240 miles. This time an increase in power of 10 times changed the station range 2.7 times, a substantial increase in distance from 90 to 240 miles.

This type of information can be very helpful if future station changes are planned. By the use of the method described here to determine where your station lies on the curve, the changes required to increase your working distance to a desired value can be easily found. Conversely, it is possible to determine if a planned change will

accomplish the desired results.

It is a well-known fact that c.w. produces much better results than voice modulation in working v.h.f. DX. It becomes quite obvious why this is so by looking at Fig. 1. Take a typical f-meter station: using a 100-watt transmitter and a 5-element beam, on phone, this station can probably work a similar station 110 miles away (see point 1, Fig. 1). The use of c.w. buys an additional 17-db. gain over the use of a.m. phone. Therefore, if this station switches to c.w. with no other changes he can now work another similar station at a distance of 310 miles (see point 2, Fig. 1). The switch to c.w. has pushed the station over the hump and produced a sizable increase in working distance.

If a comparison is made between Figs. 1 and 2, it is interesting to note that if you can tolerate being able to work a station only 50 per cent of the time instead of 99 per cent of the time, the maximum working distance is increased considerably. Using the previous example of the 6-meter 100-watt station, 99 per cent of the hours of the year he could work only 110 miles, but if the operator is satisfied with 50 per cent of the hours of the year he could work 250 miles (see point 3, Fig. 2).

### Station Gain

So much for looking at the effects. In order to estimate your station's capabilities, two basic calculations must be performed. The first is the determination of a number that will be called station gain; the second is the path loss. The

station gain is made up of eight quantities: receiver sensitivity, transmitted power, receiving antenna gain, receiving antenna height gain, ransmitting antenna gain, transmitting line loss, transmitting antenna height gain, and required signal-to-noise ratio. The value of station gain is obtained by determining the value of each of these quantities and converting them to a db. value, then adding the db. values to obtain a total.

The computation of the station gain at first appears to be somewhat complicated, not due to the mathematics, but because of the various numbers which have to be obtained in order that their db. values may be added together. Two of the values are obtained by nomograms of Figs. 3 and 4. These are the receiver sensitivity and the antenna height gain. These and the other quantities are discussed one at a time with clues as to where the appropriate numbers may be found.

### Receiver Sensitivity

The largest number in the station gain is the sensitivity of the receiver. The nomogram of Fig. 3 is used to calculate this. In order to determine the value, a straightedge is placed between the appropriate receiver bandwidth value on the left-hand scale and the noise figure of your converter, plus line-loss value, on the right-hand scale. The receiver sensitivity is then given on the center scale. The receiver bandwidth for phone will vary for the particular receiver, from approximately 2 to 10 kc. Your receiver instruction book probably will list the phone receiver bandwidth. This value should be used. If the receiver is used on c.w., due to the properties of the ear, the value of approximately 500 cycles proves best for the receiver bandwidth scale, regardless of the actual receiver bandwidth in the range from 3 kc. to 100 cycles. Therefore, computations of phone signals use between 2 and 10 kc. for the receiver bandwidth and 500 cycles for the receiver bandwidth for the reception of

The noise figure may be a little more difficult to determine. If you have a commercial converter, the instruction book may list its noise figure. If your converter is homemade, the noise figure could vary anywhere from 2 to 10 db., depending on the tube type used in the front end and the frequency band. If you do not know the value of the noise figure of your receiver, one way to determine this is to look at the commercial converter specifications which have a tube line-up similar to yours. The back pages of QST are likely to have some of these converter ads. In addition to the noise figure, the line loss from the receiver to the antenna must be computed. This is easily done by the use of the ARRL Handbook or Antenna Book, which list the transmission-line losses in db. per hundred feet. as a function of the frequency, for all common types of coaxial cable and open-wire line. By adding together the noise figure in db. and the line loss in db., then drawing a line between this

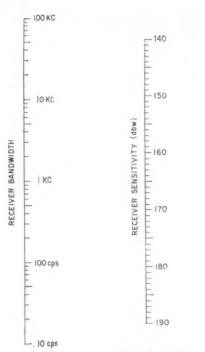


Fig. 3—Nomogram for finding effective receiver sensitivity.

value and the chosen receiver bandwidth, the receiver sensitivity is obtained on the center scale. This number as noted on the chart is in dbw., meaning that it is a given number of db. below the reference level of 1 watt. To be strictly correct, a negative sign should be in front of these db. numbers, but it has been omitted since we are computing a value we will call station gain.

### Antenna Gain

The next largest number in the station gain is the gain of your transmitting antenna and the gain of the other station's receiving antenna, or vice versa. Of all the numbers used in the specifications of amateur radio equipment, the antenna gain is probably the one most loosely defined and the least likely to be believed. Therefore, for the antenna gain, although you can use the antenna gain as advertised by your antenna manufacturer (if you have a commercial antenna), probably a better and more conservative figure could be obtained by using a simple formula. The gain of a Yagi-type antenna is approximately equal to 10 times the boom length in wavelengths. This formula is independent of the number of elements.

Expressing this antenna gain in terms of length in feet and the frequency used:

$$G_P = \frac{LfN}{98}$$

where

 $G_P = Gain of the antenna expressed as a power ratio.$ 

15

13

10

8

6-

NOISE FIGURE PLUS LINE LOSS

L =Length of the antenna in feet

 f = Frequency of station in megacycles
 N = Number of stacked antennas of the same length stacked widely apart.

This number must then be converted into db. by the standard db. formula or by using the db. table in the *Handbook*. This is the gain of the antenna if it were in free space. However, since most antennas are operated over the ground and pointed at the horizon, an additional gain due to the earth's reflection should be added to this calculated antenna gain. This value should be around 4 db. for most u.h.f. antenna sites. Therefore, obtain the antenna gain by the formula or commercial specifications and add 4 db. to this number. If you have a collinear antenna you had better use the commercial specification, or a reasonable estimate, and then add the 4 db. for ground reflection.

#### Antenna-Height Gain

Because the nomogram for the calculation of path loss is based on an antenna height of 30 feet, receiving and transmitting, an additional nomogram is required in order to obtain the antenna-height gain if your antenna is of a height other than 30 feet. The antenna-height gain is a function of the distance to the station you are working and therefore the nomogram of Fig. 4 has a distance scale in the center. As noted on this scale, from 10 to 30 feet, all station distances are considered to be at the point indicated by the arrow; i.e., 10 miles. However, for antenna heights from 30 to 100 feet, the specific station distance should be used as a point through which to draw the line from your antenna height (left-hand scale) to obtain the height gain on the right-hand scale. It should be noted that the left-hand mark on the center distance scale is for distances from 0 to 10 miles and the right-hand mark of the distance scale holds for all distances from 100 to 500 miles.

To determine antenna-height gain, lay a straight-edge from the value of antenna height intersecting the station distance in the center of Fig. 4 and read the height gain on the right-hand scale.

#### Transmitter Power

The transmitter power is an easy one to calculate. Since you know the power input you are running, convert this into the db. ratio referred to 1 watt, since the receiver sensitivity is referred to 1 watt. That is, your input power divided by 1 is used for your db. ratio calculation; or look it up in the db. table of the *ARRL Handbook*. Because the transmitter is not 100 per cent efficient, subtract 2 db. for efficiency in the 50- or 144-Mc. bands and as much as 4 db. for the higher bands.

As an example, a 100-watt transmitter expressed in db. is equal to 20 db., minus 2 db. for efficiency, or 18 db.

### Transmitter Line Loss

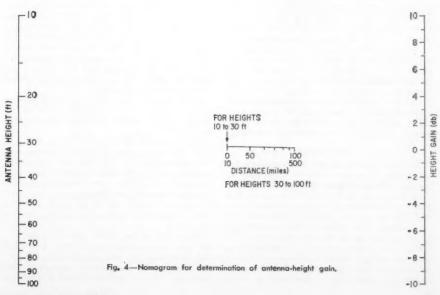
As with the receiving station line loss, this

can be obtained by looking up the specific cable loss in the ARRL Handbook.

### Required Signal-to-Noise Ratio

Because all forms of modulation are not as efficient as c.w., a required signal-to-noise ratio must be subtracted from the station gain. For c.w., no additional signal-to-noise ratio is required, since this is used as a standard. For single sideband, subtract 3 db. from the station gain. For a.m., subtract 7 db. (The additional 10 db., purely a bandwidth factor, is included in the nomogram, Fig. 3).

In addition to loss of signal due to the type of modulation, a fading loss must also be subtracted from the station gain. It has been shown that for station distances of over approximately 100 miles, a fade amplitude of 13.5 db. exists. This is a within-the-hour fade. The path loss curves are expressed as representing a given percentage of hours of the year, because withinthe-hour additional signal changes can be expected. The curves are for the average signal for any hour. Thus, since a 13.5-db, signal change will occur at some variable rate within a period of a few minutes, the signal will drop about 7 db. below the average and then rise 7 db. above the average. This fading is familiar to all v.h.f. operators. Although the rate of fade will be variable, the amplitude is constant. Therefore, in order to copy another station solidly it is necessary to subtract this 7 db. from the station gain. This holds for all distances greater than 100 miles. For distances shorter than 100 miles it drops off almost in a straight line. For a 50-mile station-to-station distance, subtract 3.5 db., etc.



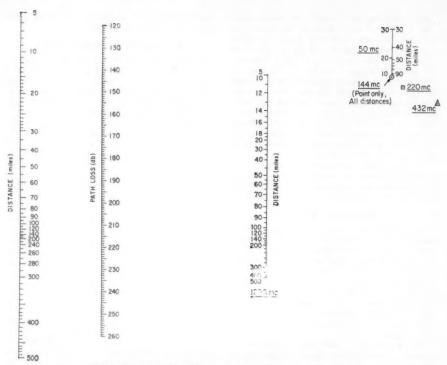


Fig. 5-Nomogram for finding distance capabilities of v.h.f. stations.

Therefore, subtract from the station gain 0 db. for e.w. or 3 db. for s.s.b., or 7 db. for a.m., and an additional 7 db. for fading.

Having obtained the values required to obtain station gain as discussed above, the station gain is obtained from the following procedure: (1) From Fig. 3 obtain receiving-station receiver sensitivity. (2) Add transmitting-station power in db. (3) Add receiving-station antenna gain in db. (4) Add receiving-station antenna-height gain in db. (if it is negative, subtract it). (5) Add transmitting-station antenna gain in db. (6) Add transmitting-station antenna-height gain in db. (watch that negative value). (7) Subtract transmitting-station line loss in db. (8) Subtract required signal-to-noise ratio, 0 for c.w., or 3 db. for s.s.b., or 7 db. for a.m., and 7 db. for fading.

### Path Loss

The determination of path loss is considerably easier than the station gain. It is obtained by the use of the nomogram of Fig. 5. This is the same information as shown in Fig. 1, except that in nomogram form it is considerably more accurate. The use of this nomogram gives the path loss between two stations over a smooth earth for 99 per cent of the hours of the year. To determine the value of path loss, lay a straightedge from the value of distance between stations on the left-hand scale to the same distance on the appropriate right-hand distance scale and read

off the value of path loss on the center scale. The right-hand distance scales are for the various amateur bands between 50 and 1300 Mc. However, note that some of the bands have incomplete right-hand distance scales. 1296 Mc. has a complete distance scale. For 432 Mc., use the dot surrounded by the triangle as the distance scale. For 220 Mc., use the dot surrounded by the square. For 144 Mc., use the dot surrounded by the circle. For 50 Mc., use the dot surrounded by the circle for distances from 5 to 10 miles and from 90 to 500 miles. Use the scale as marked between 10 and 90 miles.

As an example, the path loss at a distance of 50 miles is 185 db. for 1296 Mc., 178 db. for 432 Mc., 176 db. for 220 Mc., 175 db. for 144 Mc., and 174 for 50 Mc.

This path-loss information can be used two ways. Choosing a distance between stations and then determining the path loss, this value subtracted from the station gain gives the signal strength at the receiver, over and above that required, expressed in db. This can be converted to S units by dividing the db. value by 6. If the value is negative, the station is too far away to be worked.

If, in figuring the station gain as above, you use your own station receiver and transmitter parameters and use your antenna gain for both the receiving antenna gain and transmitter antenna gain, this will give the station gain for two

similar stations. If this value of station gain is entered on the center scale of Fig. 5 as the path loss, and the straightedge adjusted to lie on same value on both left-hand and right-hand distance scales, and if a right-hand distance scale exists, this is the distance which can be worked by your station if a similar station to yours were at that distance. This calculation can be used to get an idea of how far you could expect to work other stations, unless some favorable propagation is present. It is also helpful for determining what result station changes produce.

One last consideration should be made when choosing the distance between stations. The nomogram of Fig. 5 is based on a smooth earth. If the terrain at the horizon at your location is higher or lower than your antenna, a correction can be made to the distance between stations in order that a more nearly correct path loss will be obtained. After determining the air-line distance between stations of interest, determine the horizon elevation angle in degrees in the direction of the station to be worked and multiply it by 69 miles. If the angle is positive, add this new value to the distance: if the angle is negative, subtract this distance from the actual disstance This correction should be made for both stations.

### Examples

Determination of the signal strength above that required, from Station A to Station B:

Station A Receiving	Station B Transmitting
Frequency: 144 Mc.,	Distance: 200 miles
C.W.	Transmitter power:
Receiver noise figure:	250 watts
3 db.	Transmitter line: 100
Transmission line: 40	ft. RG-8
ft. RG-8	Antenna: 2 Yagis 28
Receiver bandwidth:	ft. long
500 cycles	Antenna height: 65 ft.
Antenna: 14-ft. boom	Horizon angle: -0.5
Antenna height: 20 ft.	degrees
Horizon angle: +1.2 d	egrees

### Preliminary Calculations

- a) Looking up transmission-line loss in the ARRL Handbook, you find 1.0 db. for the receiver and 2.5 db. for the transmitter.
- b) Compute antenna gain  $G = \frac{(14)(144)}{} = 20.6$ , or 13 db. for the receiver.  $G = \frac{(2)(28)(144)}{} = 82$ , or 19 db, for the transmitter.

Then find station gain:

- 1) Receiver sensitivity (Fig. 3), 500 172.5 db. cycles and 4 db.:
- Transmitter power, 24 − 2 db.: 22 db.
- 3) Receiver antenna gain, 13 db. + 4 17 db.
- (4 db. for earth reflection) 4) Receiver antenna-height gain -3.2 db.(Fig. 4):

- 5) Transmitter antenna gain, 19 db. + 4 db .:
- 6) Transmitter antenna-height gain (Fig. 4): +3.2 db.
- 7) Transmitter line loss: -2.5 db.
- 8) Required signal-to-noise ratio, 0 db. C.W.: -7 db. fading:

Total Station Gain = 225 db.

23 db.

Path Loss Computation:

Find distance correction:

 $1.2 \text{ degrees} \times 69 = 82.8 \text{ miles}$ a) Multiply Mult ply -0.5 degrees  $\times$  69 = -34.5

Total correction = +48.3 m.les

- b) Find effective distance: 200 + 48 = 248 miles Find path loss:
- 1) Lay straightedge from 248 miles on left-hand distance scale to the dot surrounded by a circle (114 Mc.) on the right-hand scale.

Find path loss = 203.5 db. Find signal strength above that required:

= 225 db.1) Station gain = 203.5 db.Path loss Signal above required = 21.5 db.

or in S units,  $\frac{21.5}{6} = 3.6$  S units.

Determination of maximum range of two stations of similar equipment.

Frequency: 1296 Mc., a.m. phone Receiver noise figure: 9 db. Transmission line: 60 ft. RG-11. Receiver bandwidth: 3 kc. Antenna: 4-ft. boom, Yagi Antenna height: 40 ft. Transmitter power: 50 watts

Horizon angle: 0 degrees

Distance = ?

Preliminary calculation: a) Looking up transmission line in MRRL Hand-

book, you find 60 ft. RG-11 = 4.8 db. b) Compute antenna gain: (4) (1296) = 52.9 = 17.2 db.

Find station gain:

- 1) Receiver sensitivity (Fig. 3), 3 kc. and 13.8 db.: 155 db.
- 2) Transmitter power, 17 db. 4 db.: (-4 db. because of low efficiency at 1296)
- 3) Receiver antenna gain, 17 db. + 4 21 db. db.:
- 4) Receiver antenna height gain (Fig. 4): (distance unknown but 1.5 db. guess 80 miles)
- 5) Transmitter antenna gain, 17 db.
- 21 db. + 4 db.: 6) Transmitter antenna height gain: 1.5 db.
- 7) Transmitter line loss: -4.8 db. 8) Required signal-to-noise ratio:
  - -7 db. a.m. fading -7 db. Total station gain = 194.2 db.

(Continued on page 162)

### Announcing the 28th ARRL Sweepstakes

November 11-13 and 18-20

### CONTEST PERIODS

Saturday Nov. 11 Monday Nov. 13 0801 GMT 2300 GMT Saturday Nov. 18 Monday Nov. 20 2300 GMT OBOI GMT

T'S NEARLY post time for the 28th running of the ARRL Sweepstakes, so make sure your station is at the starting gate raring to go for another enjoyable contest. The race simply consists of making contacts during the contest hours, and swapping contest exchanges. You can enter the phone or c.w. contest, or both.

For the two week ends, forty hours is the maximum operating time allowed. The contest starts (dates and times listed above) on Saturday afternoon and ends early Monday morning - for two week ends. The phone and c.w. contests are considered separate, so send in separate logs.

The rules are the same as last year. A certificate is awarded to the highest scoring single-op in each ARRL section (plus Yukon-N.W.T.). A certificate also goes to the top Novice, Technician, and multiple-operator entry for those sections with sufficient entries; see the rules for award details. A favorite competition is between clubs. You may also credit your score to your club for separate club aggregate listing (total of all club members scores) . . . with an engraved cocobolo gavel to the club with the highest total, and a certificate to each club's top phone and c.w. scorer. Here's a good club project . . . get out your gang to help the club score. Make sure logs are clearly marked: "Participating for club award in the ..... (club).

The annual trophy donated by W3GJY will this year be known as the Ev "Pappy" Mayer, KP4KD Memorial Award to be awarded to the highest scoring single-op in the 1961 SS.

"CQ SS" or answering such a call will get you in business in this contest, and send the exchange information as shown at the top of the next page. Make sure you use GMT in your time exchange. See page 105, this QST, to convert to GMT.

For this contest, Yukon-N.W.T. (VE8) counts as a separate section, and VOs as Maritime.

Check carefully the complete rules which follow. You'll find yourself trying to jog your memory on whether you've worked a station or not, so we suggest use of ARRL Operating Aid No. 6, a check list of stations worked. This helpful contest form as well as log forms are free on request: write today to ARRL Communications Dept., 38 LaSalle Road, West Hartford 7, Conn. Logs must be postmarked by December 20, 1961, to be eligible for score listing and awards.

#### Rules

1) Eligibility: The contest is open to all radio amateurs in (or officially attached to) sections listed on page 6 of this issue of QST

 Time: All contacts must be made during the contest periods indicated elsewhere in this announcement and between amateurs in (or officially attached to) the 72 sections. Yukon-N.W.T. (VE8) counts as a separate section. Time may be divided between week ends as desired, but a total of 40 hours must not be exceeded for each entry. Time spent in listening counts as operating time

3) QSO: Contacts must include certain information sent in the form of a standard message preamble, as shown in the example. C.w. stations work only c.w. stations and phone stations only other phones. Valid points can be scored by contacting stations not working in the contest, upon acceptance of your preamble and/or receipt of a preamble

4) Scoring: Each preamble sent and acknowledged counts one point. Each preamble received counts one point. Only two points can be earned by contacting any one station, regardless of the frequency band. The total number of ARRL sections (see p. 6) worked during the contest is the "section multiplier." It is not necessary for preambles to be sent both ways before a contact may count, but one must be received, or sent and acknowledged, before credit is claimed for either point(s) or multiplier. Apply a "power multiplier" of 1.25 to c.w. entries and 1.5 to phone entries if the input power to the transmitter output stage is 150 watts or less at all times during contest operation.

The final score equals the total "points" X the "sections

multiplier"

X the "power multiplier."

5) Reporting: Follow the sample shown in reporting contest results. Printed contest forms will be sent free on request. Indicate starting and ending times for each period on the air. All Sweepstakes reports become the property of ARRL and none can be returned.

There are no objections to one's obtaining assistance from logging, "spotting" or relief operators, but their use places the entrant in the multiple-operator class, and it must be

so reported.

A single-operator station is one manned by an individual amateur who receives no assistance from other persons during the contest periods. He may not have assistance in any manner in keeping the station log and records, or in spotting stations during a contest period. The operation of two or more transmitters simultaneously is not allowed. Contest reports must be postmarked no later than December 20, 1961, to insure eligibility for QST listing and awards.

6) Awards: Certificates will be awarded to the highest c.w. scorer and to the highest phone scorer in each ARRL section. A c.w. certificate will also be awarded to the highest scoring Novice or Technician in each section where at least three such licensees submit c.w. logs; similarly, a phone certificate will be earned by a Novice or Technician in each section where a total of three such licensees submit phone logs. A certificate also will be awarded to the highest scoring Novice and Technician from sections of less than three entries . . . that in the opinion of the Awards Committee

### HOW TO SCORE

Each preamble sent and acknowledged counts

Each preamble received counts one point. Only two points can be earned by contacting any

one station, regardless of the frequency band used. For final score: Multiply totaled points by the number of different ARRL sections worked; that is, the number in which at least one bona fide SS point has been made. Multiply c.w. scores by 1.25 and phone scores by 1.5 if you used 150-watts-or-less transmitter input at all times during the contest.

EXPLANATION OF "SS" CONTEST EXCHANGES									
	ke a Standard reamble, the NR	Call	CK	Place	Time	Date			
Exchanges	Contest serial numbers, 1, 2, 3, etc., for each station worked	Send your own call	CK (RST report of station worked)	Your ARRL section	Send GMT time of trans- mitting	Send date of QSO			
Sample	NR 1	W1AW	589	CONN	2301	NOV 11			

displayed exceptional effort. Only single-operator stations are eligible for certificate awards. Multiple-operator scores will receive separate QST listing in the final results.

A gavel will be awarded to the highest club entry. The aggregate scores of phone and c.w. reported by club secretaries and confirmed by the receipt at ARRL of contest logs constitute a club entry. Segregate club entries into phone and c.w. totals. Both single- and multiple-operator scores may be counted, but only the score of a bona fide club member, operating a station in local club territory, may be included in club entries.

The highest single-operator c.w. score and the highest single-operator phone score in any club entry will be rewarded with a "club" certificate where at least three singleoperator phone and/or three single-operator c.w. scores are submitted.

7) Disquilification: Failure to comply with the contest rules or FCC regulations or the necessity for avoiding interference with channels handling amateur emergency communication shall constitute grounds for disqualifications. In all cases of question, the decisions of the ARRL Contest Committee are final.

#### SUMMARY OF EXCHANGES ARRL SWEEPSTAKES CONTEST W.IAW... CONN. .... CW or PHONE?...C.W..... SECTION... SENT (1 point) RECEIVED (1 point) B Nr. D Time diff I on or Secs N Moff Sec-DATE DATE CAir STN RST tion TIME (Nov) NR STN RST Section TIME (Nov) wkd S 3.5 2300 2 WIAW 589 CONN 2301 EPA 2 W3JNQ 589 2302 589 2303 5 W4KFC 589 VA 2304 2 3 579 2305 5 WIJYH 579 WMASS 2305 2 4 359 W3GYP 2325 5 2 KIAPR 599 WMASS 2322 2 14 1900 6 189 KH6 IJ 579 HAWAII 1905 569 1903 2 1915 7 589 201 WOSMV 599 S DAK 1907 1906 5 2 3.5 2105 8 599 2107 198 WIEOB 599 WMASS 2108 2 57 W3GYP 589 EPA 1 307 K2DGT 579 NYC Assisting person(s) name(s) or call(s) etc.:.... SCORING: .. 18... points X . 6.. Sections X 1:25 Pwr Mult.\* = .. 135.... CLAIMED SCORE \*Power multiplier: C.W. -- 1.25 for 150 watts or less input at all times. \*Phone -- 1.5 for 150 watts or less at all times. Otherwise the multiplier is 1.0. Participating for club award in the ......(name of club) I have observed all competition rules as well as all regulations established for amateur radio in my country. My report is correct and true to the best of my knowledge. Signature Address



# The S Meter— False Idol

BY EDWARD P. TILTON,\* WIHDO

EELING that on-the-air results are the only true indication of the merit of new antenna ideas, the writer frequently enlists the aid of other amateurs in antenna evaluation. This cooperation is always available, and we are eternally grateful for it, but whenever this kind of work is undertaken, the disparity in signalreporting methods among hams is brought home with full force. Most reports vary so widely that no quantitative data can be obtained from them, and they serve only to show in a general way how the antennas being tested behave in transmitting. How much difference there is between the antennas under test you could never guess by the figures taken from that magic device of the modern communications receiver, the so-called S meter.

That S meters vary is not surprising when we consider all the factors that affect their accuracy, even on receivers of the same make and model. let alone receivers of all makes and models. What is surprising, and to some extent distressing, is the blind faith most hams place in their S meters. After all, Joe Ham thinks, he paid several hundred dollars for the impressive box on the operating table - if he can't trust the manufacturer of a high-quality receiver, what can a man believe in? If he is one of those rare amateurs who reads his instruction book, he won't often find much help there. The book may ignore the S-meter entirely, or state that the meter is set up so that a 50-microvolt signal reads S9, and that each S unit represents a 6-db. change in signal level. But are these things true? A check of a few receivers will show that you can't rely on them.

### What is an S Unit?

We had trouble with signal reporting long before S meters were invented. We won't go into the many psychological aspects of this problem, including the desire for a QSL from the station being worked, but will consider only the practical business of reporting signals as they really are

for the fellow who presumably wants to know the truth. For him the S meter can be very helpful, if he understands its limitations — but how many hams do?

Even if the meter on a communications receiver worked the way the maker intended, there could be plenty of confusion, for nobody has ever come up with an entirely satisfactory method of reporting signals, let alone measuring them. Suppose 50 microvolts is S9, what is S7, S3, or S1? If we step down at the rate of 6 db. per S unit, reading in microvolts, S8 is 25, S7 12.5, S6 6.25, and so on down to S1 at 0.2 microvolts. This looks nice until you realize that, in v.h.f. work at least, a lot of amateur communication is done with signals well below this level. What are you going to call them, "db. below S1?" This same scale is out of step with reality in the opposite direction on the 75-meter band, where the noise level may be a lot higher than 0.2 microvolt. When was the last time you heard a 75-meter a.m. report that was not in "db. above S9?"

Starting from the noise level and working up may make more sense, though you run into trouble deciding what SI is going to be. For the higher bands, a good starting point may be 0.1 microvolt. S2 is then 0.2, S3 is 0.4, and so on up to 12.8-microvolt S9. This would be quite a satisfactory scale, on the whole, if the receiver sensitivity and gain could be held the same across the entire range. This is no mean accomplishment, and few receivers make it. A 75A-4 in the ARRL Lab has almost precisely this scale, and the level holds within about plus-or-minus 11/2 db. from 10 through 80. This is not to say that other 75A-4s do likewise; we only know that this one does. The A-4 instruction book doesn't mention the S meter, so there is no way of knowing whether this nice scale is accidental or intended.

A 75A-2 showed S1 to vary from 0.8 to 2.5 microvolts, depending on the band. S1 to S2 was a jump of 3 db., S2 to S3 was 2 db., S3 to S4 3 db., S4 to S5 2 db., 5 to 6  $24_2$  db., 6 to 7  $24_2$ , 7 to 8 3, 8 to 9  $24_2$ . "20 db. over S9" was actu-

<sup>\*</sup>V.H.F. Editor, QST.

ally only 9 db. over. "40 over" was 18 db. over, and "60 over" was actually 30 db. over. "89" averaged 11 microvolts across the 6 bands covered. You can get some nice antenna gain figures using a scale like that! Yet this is probably closer to reality than many receiver meters are—even some of them brand-new. When receivers of the less-expensive variety are as old as that 75A-2, it is anybody's guess as to what the S units and decibels imprinted on their meter faces really mean.

It is easier to achieve some semblance of Smeter reason in receivers of the amateur-bandspread type than in the two-dial general-coverage jobs. The latter must tune from the low end of the broadcast band through 30 Mc., and it is all but impossible to keep gain and sensitivity uniform over such a tremendous frequency range. One medium-priced general coverage rec iver had a fairly satisfactory S-meter scale if the control in the meter circuit was reset for each band. Another, still smelling of the factory, went to S9 on the 80-meter band with 1.2 microvolts input. S1 was 0.1 microvolt, and the S units along the way averaged around 3 db. each. But on 40, the meter read S1 with 1.8 microvolts, and on 28 Mc., the meter didn't start to move until a 5-microvolt signal was fed into the receiver. Thus, "S1" on 28 Mc. was actually 50 times the signal strength that it was on 3.5 Mc. And "60 db. over S9" on 75 meters was only a 50-microvolt signal! No wonder some of those 75-meter fellows think they're getting out well!

But it is on the v.h.f. bands that the db.-over-S9 craze reaches its ultimate. In one antenna project the writer used a Communicator III, with its meter calibrated against a good signal generator in the lab. Readings taken early in the project appeared inconsistent with the expected performance of the antennas, so we looked into the matter and found that the Communicator meter told a wholly different story when the unit was operated from a car battery than when it was run from the a.c. line. This was the result of the voltage delivered by the power supply being considerably lower on battery power, causing circuits to overload more readily in battery service and making the upper portion of the meter scale almost meaningless.

It is apparent to anyone who operates on bands where new hams appear in considerable numbers that the newcomer always tends to pick up bad habits of his associates, so these habits become standard practice in operating. This is certainly true of S-meter worship among v.h.f. men. If you take the trouble to ask, you will often find that the fellow who just gave you a "30 db. over S9" report is using a Communicator I or II the original "green-eyed monster" of the 2-meter band. If he gives you tess than "10 db. over S9" you know you're in trouble. Or he may have a III, which has a meter. How does he know what S9 is, and what does his report in "db. over S9" mean? Gonset didn't tell him. Here is what the manufacturer says: "On reception the tuning meter serves as a relative (italics are theirs!) carrier strength indicator. Note that the meter is not intended to read actual S units."

Two fellows using Communicator IIIs gave the writer reports in "db. over S9." One added, "And I think that's a fairly accurate report." Yet the spread of 16 db. he reported was actually less than 8. Where did his "decibels" come from? Probably from comparison of his Communicator meter with readings taken from some communications receiver that had an "S meter," if they were anything but pure imagination! Who are we trying to fool?

### Giving Sensible Reports

Enough indictments - what do we do about it? S meters are here to stay, and they are mighty useful operating aids, if we use them with discretion. Calibration of your signal-indicating device, whether it be a meter, a green eye, or just your own ears, is not a difficult matter. If you have access to a signal generator with a calibrated attenuator that can be relied on, the task is easy. You measure the signal input required to just move the meter, start to close the eye, or the level that you can just begin to hear This is S1. Then you turn up the attenuator and note the reading in microvolts for each mark on the meter, or each step in level that sounds like an S unit to your ear. Do this with the receiver a.v.c. off if you're calibrating your ears. S9 in the ear case should be the point where the signal really is strong - where there is little, if any, receiver noise left.

No signal generator? You can still make a reasonable calibration without too much trouble. Some fellow you work on the air is sure to have a power-output indicating device (Micromatch, wattmeter, or whatever). Get him to decrease his output power by one half while you watch your meter. That's 3 db., or half an S unit. Now have him move his beam away until his signal with full power is reading what it did before with half power, and have him make the half-power cut again. Repeat this process until you have a calibration across your meter scale, green eye, or ear range. You can then forget S units, and give meaningful reports in terms of decibels above the noise level, regardless of the indicator used. Your memory won't work too well as to how S3 sounded, but you will have learned something practical about decibels, if not about S units, in the process. And while we're mentioning decibels, it might be well to check up on what a decibel really is. Webster tells you. So does the ARRL *Handbook*. The latter has a whole page on the subject. Better read it.

### Measuring Signal Strength at Audio

If you want to make a gadget for estimating signal levels by audio methods, here is a not-exactly-new idea from the Hints & Kinks section of QST for March, 1937, with quotations from the original text:

"A person trained to do so can differentiate between five values of audio signal strength:

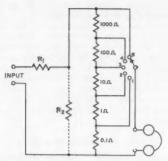


Fig. 1—Schematic diagram of a step-attenuator for use in estimating the strength of signals by audio level.

 $R_1$ —Value to match output tube; 5000 ohms satisfactory in most cases.

 $R_2$ —Shunting resistor to be used only when volume is too great without it; 10 to 500 ohms, as required.

S<sub>1</sub>—5-position wafer switch.

very strong, strong, medium, weak and very weak. But the majority of us do well to distinguish between strong and weak by ear alone, at least from memory. The audiometer of Fig. 1 may be of interest to amateurs who want to give signal reports as correctly as possible . . . using the audio output of the receiver. The device plugs into the phone jack of the receiver, and it should, of course, be used with the receiver a.v.c. off.

"The audiometer has 5 steps. A low-inductance switch and dependable fixed resistors should be used. A 0.1-ohm resistor can be made by winding 18 inches of No. 28 wire on a dowel or resistor. The optional resistor,  $R_2$ , may be used with higher volume. It will be noted that each step increases the resistance across the phones (and therefore the voltage) by approximately 10 to 1, or 20 db.

"In practice a signal is tuned in with the switch on tap 5, where it will be loudest. Then the switch is moved down the scale, putting progressively smaller resistances across the phones, until the signal can barely be heard. If the signal is heard weakly on 3 and goes out on 2, we rate the signal 3 on a 1-to-5 scale. Of course, the figures mean nothing in themselves; they simply indicate relative strength."

They indicate something else, too, we hasten to add: that a 9-S-unit scale is slightly ridiculous, and the old S1 to S5 scale used back in the '30s had a lot to recommend it! 5 was loud and 1 was weak, and even 3 more steps in between were hard enough to interpret with sense. They still are, yet now we have 9 steps, plus those evergrowing "db. over S9!"

### Using Converters

Using S meters is a cockeyed business with a communications receiver alone, but it gets worse when converters or preamplifiers are used ahead of the receiver. All is not lost for the v.h.f. man, however — there are ways to make sense with a

converter-receiver combination. The signal coming from a converter is almost the same thing as one coming in on the antenna at 14 Mc., or 7 Mc., or whatever frequency you use for tuning when your receiver is operated with a v.h.f. converter ahead of it. So, if you control the level of the converter output the S meter will work just the same as it does on the band used for the i.f.

Some receiver S-meter circuits have enough range so that you can turn down the receiver S-meter control to make the noise with a v.h.f. converter in use read zero on the meter, or perhaps S1, which is realistic enough. This may change the db.-per-S-unit calibration of the meter, in which case you go through the calibration process outlined earlier, with your converter attached.

If the S-meter control won't handle the signal from the converter, you can cut down the latter in any of several ways. Altering the level of signal after it leaves the converter mixer has no effect on the receiving system's sensitivity, and it will keep S-meter readings within reason. One good way to do this is with a gain-control i.f. stage. We used to put these in nearly all our Handbook and QST v.h.f. converters, but so many hams protested this extra complication that we finally began leaving them out — against our better judgment. You'll find information on gain-control stages in any Handbook of 1957 or earlier.

You can also insert resistance across the line to the receiver input, to cut down the signal to the desired level. This should be done inside the converter or receiver, as external connections may allow pickup of signals at the intermediate frequency. If the receiver has an antenna trimmer, detuning it may knock the gain of the system down to a point where S-meter readings begin to be reasonable. On the 75A-4 mentioned earlier, a 10-ohm resistor across the coax between the converter and receiver brought meter readings into line with what they were on 14 Mc., which is just about right. Don't worry about what this does to system performance - the sensitivity and signal-to-noise ratio of any receiving system worth its salt is set by the first stages of the converter, and nothing later in the receiver affects anything except gain and selectivity. In the case of the latter quality, some broadening of response at the converter output frequency is usually helpful, rather than otherwise.

If you're too lazy to do any of these things, you have one obligation to your fellow amateur. When you give a signal report, tell how you arrived at it. If it is a reading from the S meter, tell him so, and if you have not calibrated the meter recently, tell him that, too. If it's from a "green eye," don't hide behind some imaginary db.-over-S9 gobbledygook of your own invention. Tell him it's from a green eye, and tell him how much the eye closes. And if it's by ear alone, don't be afraid to say so. Ears were in business a long time before S meters, and with the current abuse of the latter the ear has a lot to recommend it!

QST

### Space Communication and the Amateur

Noise Sources and the All-Important Signal-to-Noise Ratio

BY RAPHAEL SOIFER,\* K2QBW

What are the technical factors that must be weighed in assessing the practicality of ground-to-ground amateur communication via space vehicles? In this article the author shows that the problem is one of establishing a usable signal-to-noise ratio, and discusses the various components that contribute to the noise background. Signal propagation and the important influence of equipment, including the communications satellite itself, will be covered subsequently.

MATEUR radio stands today just over the threshold of a new era. The year 1960 saw the first concrete steps taken in the effort to provide the amateur with a place in the rapidly unfolding world of space communications. Thus our position today is akin to that of 1922, when OST trotted out its famous exclamation points to announce that the Second Transatlantics had succeeded - that, for the first time in amateur history, American amateur signals were heard across the Atlantic. This discovery that wavelengths below 200 meters could actually be used for long-distance work led, in the following year, to the first transatlantic two-vay. Where the story led from there does not require my further elaboration.1

It will be the purpose of this series of articles to discuss realistically the problems which space communication poses for the amateur fraternity, and to suggest some possible directions of attack on the solutions to these problems. It will become apparent — if it is not already — that we are dealing largely with questions, unknowns, and challenges where we have been accustomed to tlaws, figures, and circuits. Supplying answers to these challenges, I hasten to add, has been the amateur's role throughout his history. I am confident that, just as his father conquered the mysteries of short-wave radio forty years before, the radio amateur of the 1960s and '70s will conquer space.

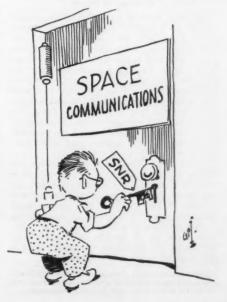
### The Problem

The entire problem of space communication can be expressed in four words: signal-to-noise ratio. This s.n.r., as it is called, is usually expressed in decibels. We will define it as the ratio, measured at the receiver, between the received power of the desired signal and the total measured noise power, both received noise and that generated in the receiver itself. The s.n.r. is the key to the entire problem. All the other so-called "obsta-

cles" to practical space communication — tracking, antenna size, transmitter power, low-noise receivers, satellite size, and the rest — are merely manifestations of the basic question of obtaining a sufficient s.n.r.

This ratio does not care how it is obtained. If technical or legal considerations limit the signal power, a suitable reduction in noise will suffice to produce the required s.n.r., and the system will work just as effectively. More generally, a deficiency in one part of the system can be made up in another part without affecting the s.n.r. and, through it, the performance of the system. It cannot be over-emphasized that only the signal-to-noise ratio is important — not signal power or noise by themselves.

The s.n.r. controls not only whether or not a system will work, but also how well, how efficiently, and how reliably. If the s.n.r. is more than a few db. below unity, no operator in ex-



\*3 Ames St., M.I.T., Cambridge 39, Mass.

<sup>1</sup> Except possibly to point out that one of the operators at the M. I. T. ham station, IXM, during the Second Transaclantics was a young electrical-engineering student named J. A. Stratton who, 38 years after IXM's success in the tests, was formally inaugurated as president of this same Massachusetts Institute of Technology. istence will be able to copy the transmitted signals.2 The communications system will, in short, be a failure. Values from essentially unity up to 6 db. or so may be termed marginal. In the range around unity, a highly skilled operator may be able to copy short snatches of c.w. As the s.n.r. goes up, copy becomes less and less difficult, becoming fairly normal at 10 db. or thereabouts. Voice work requires a higher s.n.r. Values from 6 to 10 db. may here be termed marginal, the same conditions applying as for c.w. - except, of course, for the higher s.n.r. requirement. Copy becomes normal on voice at values greater than 10 or 12 db. The higher the s.n.r., in general, the more sophisticated the method of communication that may be used. For s.n.r. values greater than 17 or 20 db., slow-scan television becomes practical. At higher values, multiplex techniques become feasible, as well as improved performance when using the modes discussed heretofore.

Unfortunately, values of received signal and noise generally do not remain constant with time. Because of their variation from season to season, day to day, and minute to minute, systems must generally be designed to have a higher s.n.r. than would ordinarily be needed. This provides margin in case of bad conditions — in a word, reliability. The greater the percentage of reliability desired, the greater margin must be provided in the form of increased s.n.r. in the system design.

In considering the various elements which contribute to this all-important ratio, we will consider first the noise components — bearing in mind, of course, that noise does not tell the whole story, that only when combined with signal strength in the form of the s.n.r. is it actually significant.

#### Sources of Noise

The noise heard at the output of the receiver is made up of several components, chiefly cosmic noise, tropospheric noise, apparatus noise, and man-made noise. Beneficially, the stronger component will tend to screen the weaker one from being noticed, a condition which stems from the fact that most noise is made up of nonperiodic waveforms. Thus, one often can concern himself only with the strongest noise component in a given situation and neglect the others. This nonperiodic property also means, unfortunately, that noise cannot be phased out, as can sinusoidal waveforms. We will consider each noise component in the order given above.

Cosmic Noise. This is noise that reaches our planet from other regions of the universe. It is generated, among other sources, in interstellar gas clouds. Cosmic noise is of principal concern between 20 Mc. and 1000 Mc., and decreases logarithmically with increasing frequency. Being a close approximation to "white" noise — i.e., noise made up of random pulses distributed throughout the frequency spectrum — there is little that can be done to counteract it.<sup>2</sup>

It does, however, have one interesting property: It is not received with equal strength from all directions. It can be reduced, then, by aiming antennas in minimum-noise directions. Other considerations obviously make this method one of limited usefulness.

Interestingly enough, it was precisely this directional property that led early investigators, Karl Jansky and Grote Reber, to discover the true origin of this noise form, leading eventually to the identification of the most powerful radio stars. Thus was founded the important science of radio astronomy.<sup>4</sup>

Tropospheric Noise. This is the familiar "static" heard on lower frequencies near thunderstorms. As its name implies, it is generated by weather phenomena in the lower atmosphere and is by far the most significant natural noise source on frequencies below 20 Mc. It drops off sharply with frequency, and above 30 Mc. it may be ignored. Except for clipping to eliminate the sharper peaks, little can be done to alleviate it in the frequency range in which it is found.

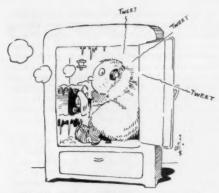
Apparatus Noise. Though some noise is generated in transmitters, the most important components of apparatus noise are produced in the receiving antenna, transmission line, and receiver front end. This noise is largely thermal in origin, and results from random movement of molecules. Because of this randomness it is an excellent approximation to white noise. The noise power is proportional to absolute temperature and receiver bandwidth, a relationship usually expressed algebraically as kTB (k is a proportionality factor, Boltzmann's constant). Its actual intensity obviously depends on the equipment in use.

Apparatus noise becomes important at frequencies above 30 Mc., and its stature as a problem increases approximately logarithmically with frequency. It can be greatly minimized by using specially-designed antennas with a low equivalent noise temperature, and by using lownoise amplification devices in the front end of the receiver. The question of r.f. amplifier noise figure is well known to most amateurs and need not be gone into here, except to state that this is one area in which a great deal of development work has been done and is still going on. At frequencies where apparatus noise can predominate, the best of the low-noise triodes have today been superseded by such devices as parametric amplifiers. Another branch of development has sought to reduce amplifier noise by reducing the temperature at which the amplification is conducted (remember the T in kTB!) and in amplifying by means of solid-state devices which offer high transconductance with a minimum of random molecular movement. Such development led to the ruby maser which operates near absolute zero and which contributed largely to the success of Project Echo.

<sup>&</sup>lt;sup>2</sup> By means of specially designed pulse trains, transmitted information has been detected with the s.n.r. as low as -30 db. We will return to this topic later in the discussion.

<sup>&</sup>lt;sup>3</sup> For supplementary information on cosmic noise, see McLaughlin and Hobbs, "Noise Factors Affecting V.H.F. Communication," QST, June, 1961; and Bray and Kirchner, "Antenna Patterns from the Sun," QST, July, 1960.

<sup>&</sup>lt;sup>4</sup> For background information on radio astronomy, see Goodman, "Radio Astronomy," *QST*, May, 1956.



The wise amateur will keep a wary eye on these developments, for they represent a great field for improvement of the state of the art. Incidentally, front-end noise has a tendency to mask noise originating in the later stages of the receiver, so it may not be necessary to worry much about noise considerations when designing the i.f. strip.

Man-Made Noise. This noise, emanating from electric motors, automobile ignition, switching, and similar products of our own technology, can extend throughout the radio spectrum and is in general a most serious problem wherever it is found. In fact, it will often prove a good deal stronger than all other noise types combined. Because it takes so many different forms, specific rules about it are impossible to formulate. The sharper peaks, such as those typical of ignition noise, may be clipped off or blanked out by limiters or silencers. However, there is little else that can be done at the receiver to eliminate man-made noise, aside from such obvious measures as filtering the power line.

The saving factor, however, is that man-made noise is only infrequently found in bands above 500 Mc. It's just like the plague, though — if it breaks out in your vicinity you'd better move.

Man-made noise usually will show directive properties, so the antenna can be aimed so as to minimize it. But, just as in the case of cosmic noise, this technique is of limited value. Nevertheless, use of highly directive antennas can be shown to have a beneficial effect in combating this noise, except perhaps in the larger cities.

#### Bandwidth

Since noise values vary a good deal from station to station, it would not be possible to present a quantitative analysis of noise level as a function of frequency which would hold for all cases. Nevertheless, based upon the noise sources we have considered, we may conclude that less noise will be encountered on u.h.f. and higher frequencies than on lower bands. Thus, with a wary eye cocked on the s.n.r., we will consider these higher frequencies to be more suited to our purposes than

Specific values of noise level are too variable to be quoted here. They are treated in engineering handbooks such as Reference Data for Radio Engineers, Fourth Edition, published by I. T. & T. Corp., 67 Broad St., New York City.

those lower in the spectrum. Comparing this conclusion with the roster of amateur bands — and remembering that the 420-Mc. power limit robs us of 13 db. in obtainable s.n.r. — we see that the lowest useful amateur assignment in the u.h.f. range begins at 1215 Mc. Let us then adopt this value as the lower bound on what we will eventually call the optimum range for amateur space communications. We are not yet in a position to evaluate the upper bound, which will come out of the discussion of propagation and path losses in a subsequent article.

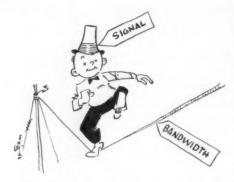
At this point it is well to recall the factor kTB we came across in discussing apparatus noise. It tells us that the greater the bandwidth, the more apparatus noise. It turns out that cosmic noise and tropospheric noise similarly increase with bandwidth. In the case of man-made noise, the relationship is not so simple because of its widely differing forms. In general, though, man-made noise does increase with bandwidth, but the

increase may not be linear. In order to minimize noise and thereby raise the s.n.r., then, one thing we can do is to reduce the bandwidth of the receiver. This can be done easily enough, and is in fact standard procedure. But useful as narrow-band systems undoubtedly are, they are not, at microwave frequencies, an unmixed blessing. For one thing, frequency stability in both the transmitter and receiver can be quite a problem in this part of the spectrum. Narrow bandwidth in the receiver means that care must be taken to insure that the signal will not drift so far that it leaves the passband. This means ultrastable oscillators and converters, and, as W1FZJ will be very happy to inform you, these can drive an engineer mad!

Additionally, systems engineers know that bandwidth serves as a limiting factor on what they term the "data rate," or the rate at which information can be sent. The faster you wish to send information, the more bandwidth your transmissions must consume (and the system thus must be capable of handling). In c.w., for example, the bandwidth occupied by a signal increases in direct proportion to the sending speed, and in cycles per second is approximately equal to four times the sending speed in words per minute.

The human voice is a notoriously poor user of spectrum space — most people talk at about 150 w.p.m., yet a single-sideband station uses up about 3000 cycles of space, and a d.s.b. or a.m. station about 6000. Conventional f.m. may use as much as 150 kc., conventional television four to six megacycles (slow-scan can be transmitted in an ordinary s.s.b. channel).

In considering bandwidth, we should not omit mention of pulse modulation methods. These may use many hundreds of kilocycles of bandwidth. In doing so, the pulse system puts out much more peak power in its short pulses than can a comparable c.w. system, which under some conditions may compensate in the s.n.r. for the increased bandwidth. This is, in fact, the principle behind the early radar systems of World War II, as well as some present-day radar.



Some engineers contend that, through the use of ingenious coding techniques far beyond the scope of this discussion, pulse emission may actually be employed to reduce the s.n.r. requirement for any given degree of reliability to levels well below those we quoted earlier. This is done, basically, by holding down the modulating data rate to what is actually needed—rather than attempting to transmit the original information, which contains many bits of superfluous data. Auxiliary circuitry at the receiver is then employed to translate the coded pulses back into aurally (or visually) useful information. While

the pulsing process itself introduces a great deal of superfluous information of its own—thus increasing the bandwidth—the coding process circumvents this difficulty by making it unnecessary for all the transmitted data to get through. Hence the received data rate duty cycle, and with it the s.n.r. requirement, may be made much smaller than would be required were all the transmitted information necessary—smaller, in fact, than if the original information with its smaller transmitted bandwidth and continuous reception requirement were being used.

In summary, then, an engineer - or a radio amateur - would like to design his system to handle the maximum possible bandwidth so as to minimize stability problems and increase the data rate reception capability. But such a design, we recall, must of necessity increase the noise. However, if the s.n.r. designed into the system is made high enough to absorb the additional noise and still remain above the requirement for the degree of reliability desired, then the bandwidth increase may be made. Thus we see that the s.n.r. determines the maximum bandwidth which a circuit can handle for any desired degree of reliability. That is, stability requirements and data rate reception capability may be considered simply as manifestations of the s.n.r. Our old friend has returned, and will keep popping up throughout our discussion.

# Strays

### Back Copies and Photographs

Back copies of QST referred to in this issue are currently available, unless otherwise indicated, from our Circulation Department. Please send money order or check —  $50\epsilon$  for each copy — with your order; we cannot bill small orders nor can we ship c.o.d.

Full size (8 by 10) glossy prints of equipment described in QST by staff members (only) can be furnished at \$1.50 each. Please indicate the QST issue, page number, and other necessary identification when ordering, and include full remittance with your order — we do not bill nor ship e.o.d.

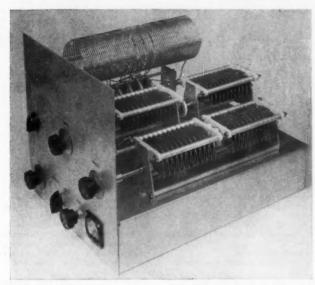




Lloyd Reed, WØBBY, is all set for emergency operation. Mounted on the front of the ½-ton Ford panel truck is a 1500-watt a.c. generator, which supplies the necessary power for the equipment inside the body of the truck. This inside gear includes a Viking Ranger, a surplus Navy RCH receiver, a 60-watt amplifier for the p.a. system, a battery charger, and monitor receivers for Minnesota Highway Patrol, local sheriff, and some police frequencies. But that's not all! WØBBY also has in that truck a conelrad monitor, some battery-powered commercial rigs for various public-service frequencies, and several more pieces of surplus gear for the ham bands. Thus, this rig will work all the ham bands up to 6 meters, and now he's planning on 2 meters also, plus the addition of some RTTY gear! Since fishing is his other hobby, he plans to cut a hole in the floor of the truck, and during the ice-fishing season he can drive out on the ice, run an 8-inch stove pipe down to the ice, and fish in comfort while he hams!

# • Beginner and Novice

Matching Network for 80 Through 10



The wide-range 500-watt transmatch. In this view of the chassis the coil and switch assembly are on the far side. In the center are  $C_2$  and  $C_4$ , with  $C_3$  on the near side. The controls along the bottom front, from the left, are for  $C_1$ ,  $S_1$  and  $R_3$  in that order.

### A Wide-Range Transmatch

BY LEWIS G. MCCOY, \* WIICP

This matching circuit uses a capacitor divider for smooth variation of loading adjustments and for simplifying band switching. Practically any antenna system can be matched to 50- or 70-ohm transmitter output. A Monimatch is incorporated for checking the matching adjustments.

The transmatch shown in the photographs and Fig. 1 will match your transmitter's 50-or 70-ohm output to antenna loads as low as 10 ohms and as large as 4000 ohms. To handle this wide range, the usual procedure would be to have several coils with a multiplicity of taps, leading to a very complex switching arrangement if band switching is desired. In this unit, however, there are no taps for feeder connections. The "tapping" is accomplished by a capacitor-divider system consisting of  $C_2$ ,  $C_3$  and  $C_4$ . The three variable capacitors are connected in series across  $L_1$ .

Either unbalanced or balanced feeders can be connected to the transmatch at  $J_3J_5$  shown

\* Technical Assistant, QST.

in Fig. 1. The load presented to the circuit at this point is easily matched to the transmitter output by adjusting  $C_2$  and  $C_4$  (which are ganged) along with  $C_3$  and  $C_1$ . Adjusting three controls to arrive at a match may sound like quite a chore, but actually is very simple, as will be explained later.

Another feature of this unit is the use of a single length of coil stock for both the primary and secondary. This practically eliminates the problem of exact duplication. Note that the link,  $L_2L_3$ , is actually two coils. For 80 and 40 meters, the two coils are connected in series to provide an 8-turn link. On 20, 15 and 10 the coils are connected in parallel, resulting in the equivalent of a 2-turn link which works out just right for these bands. This scheme keeps the link at the

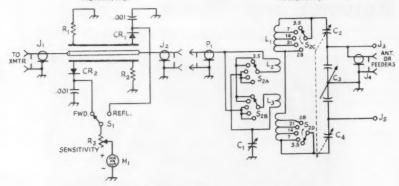


Fig. 1—Circuit diagram of the transmatch and Monimatch.

C<sub>1</sub>—250-μμf. variable, 0.045-inch spacing for high power (Johnson 250E20); 0.025-inch spacing for low power (Hammarlund MC-250-M).

C<sub>2</sub>, C<sub>4</sub>—100-μμf. variable, 0.125-inch spacing for high power (Johnson 100E45); 0.025-inch spacing for low power (Hammarlund MC-100-M).

C<sub>3</sub>—100-μμf.-per-section, dual variable, 0.125-inch spacing for high power (Johnson 100ED45); 0.025-inch spacing for low power (Hammarlund MCD-100-M).

CR1, CR2-1N34A germanium diodes.

J1, J2, J4-Chassis-type coax receptacles, type SO-239.

 $J_3$ ,  $J_5$ —Feed-through insulators,  $L_1$ ,  $L_2$ ,  $L_3$ —See Fig. 2 and text,  $M_1$ —0-1 ma, or less; see text.

P1-Coax plug, type PL-259.

R<sub>1</sub>, R<sub>2</sub>—For 50-ohm bridge, 150 ohms, ½-watt composition; for 70-ohm bridge, 100 ohms, ½-watt composition.

 $R_3$ —20,000-ohm control, linear taper.

S<sub>1</sub>—Rotary, 1 pole, 2 positions (Centralab type 1460).

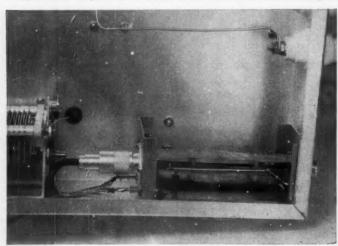
S2—Ceramic rotary, 4 poles, 5 positions, 1 pole per section, 4 sections (Centralab index type P-12?)
with type "T" or "X" sections).

exact center of the coil on all bands, thus maintaining symmetrical coupling to the secondary wind ngs.

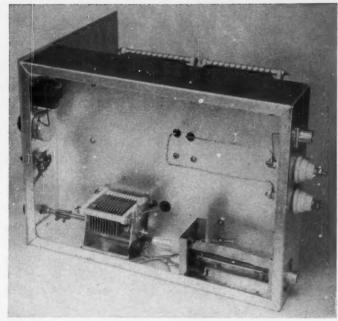
A Monimatch is included as a matching indicator. Some type of bridge is required to show when the unit is correctly adjusted, If you already happen to own a Monimatch or similar device, this part of Fig. 1 can be eliminated.

As designed and shown, this unit will handle about 500 watts on c.w. or s.s.b. and about half that power on a.m. phone. Of course, the Novice can only run 75 watts input, but most of the gang seem to want more power when they get their "Generals," so this unit was constructed with that thought in mind. However, some examples of capacitors for the 50- to 100-watt level are given in Fig. 1. The coil remains the same for either power — it's simple that way and there isn't enough difference in coil cost to warrant using a different coil.

Speaking of cost, the capacitors for the 500watt unit are not cheap. However, there should be



Close-up view of the Monimatch. The pickup wires are held in place by the insulating spacers.



This bottom view shows the arrangement of parts below deck. The link capacitor, C1, is mounted on the chassis side. In the lower foreground is the Monimatch unit.

plenty of capacitors to be found in junk boxes, and so if you don't have any around your own shack, see what the neighboring hams have. There is nothing sacred about the 100-µµf. maximum capacitance values given for  $C_2$ ,  $C_3$  and  $C_4$ . If you can find some that run higher than this, don't be afraid to use them. You should still come up with a workable transmatch. Don't use smaller values, though, as less capacitance will limit the range over which you can match.

### Construction Details

The complete transmatch, including the Monimatch, is built on a 3 × 10 × 14-inch aluminum chassis. The front panel is made from a 10 × 10-inch piece of aluminum sheet stock. A study of the top-view photograph will show you the layout.  $C_3$  is mounted directly on the chassis top along one side. Between C3 and the coil and switch assembly are C2 and C4. These two capacitors are ganged with an insulated shaft coupling. In addition, they must be insulated from the chassis and the panel. Four one-inch steatite standoff insulators are used to hold the capacitors off the chassis. The two output leads that go to  $J_3$  and  $J_5$  are taken off the rotor mounting points between the two capacitors. These leads run down below chassis to the connectors through two rubber grommets.

Fig. 2 shows how to make  $L_1$ ,  $L_2$ , and  $L_3$ . Cut a total of 66 turns from a length of coil stock, making sure to leave enough lead length at each end of the coil for connections to the switch. At 281/2 turns from each end of the coil cut the wire and unwind 1/2 turn from the support bars. This

will give you two coils of 28 turns and another of 9 turns. Cut the 9-turn coil at the center and unwind the 1/2-turn, leaving two coils of 4 turns each. The two 28-turn coils are connected at the center by soldering the two center leads together.

The coil assembly is supported by its own leads and is mounted over S2. The switch assembly S2 is made from a Centralab P-122 index and four steatite single-pole, five-position switch sections. Either type T or X is suitable. Two switch mounting brackets are used to support the switch assembly.

A word of explanation for those readers who

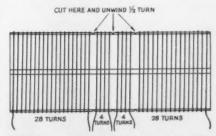


Fig. 2—This drawing shows how to make the coil assembly. Not shown are the taps needed for changing bands. The tap points listed below all are counted from the outside ends of the coil.

7 Mc .- 12 lurns.

14 Mc.—23 turns. 21 Mc.—25 turns.

28 Mc.-- 25 turns.

The coil stock in 3 inches in diam., No. 14, 8 turns per inch (Illumitronic Air Dux 2408T).

are not familiar with the Monimatch: This unit is an s.w.r. bridge designed to "sample" both the forward and reflected powers. This power is converted from r.f. to d.c. by  $CR_1$  and  $CR_2$ , and the d.c. is read on the meter,  $M_1$ . When the meter reads full scale in the forward position, a zero reading in the reflected position indicates that the transmatch is correctly adjusted.

The Monimatch is mounted in a  $2\frac{1}{4} \times 2\frac{1}{4} \times 5$ -inch aluminum box (Bud Minibox CU-3004A). Chassis-type coax fittings (SO-239) are mounted in the center of each end of the box. A piece of  $\frac{1}{4}$ -inch o.d. copper tubing,  $\frac{45}{6}$  inches long, is connected between the two inner pins of the coax fittings. The two pickup leads for the bridge are  $\frac{3}{6}$  inches long and made from No. 14 solid wire. They are held in the proper position by two insulating spacers. Details of the spacers are shown in Fig. 3. The spacers can be made from polystyrene or bakelite.

Two flat strips of copper, % inch wide by 4% inches long, are installed as shown in the photograph. The method of mounting the strips is quite simple. Solder a lug to each end of each strip, allowing the end of the lug with the screw hole to project beyond the edge. Bend this part of the lug up at right angles to the strip. The strips are then mounted by using the top and bottom screws and nuts of the coax fittings to hold them in place.

When soldering the germanium diodes to the pickup wires, hold the lead of the diode with a pair of pliers between the point of soldering and the body of the diode. This will keep excess heat from reaching the diode and ruining it.

For a 50-ohm bridge  $R_1$  and  $R_2$  should be 150-ohm,  $\frac{1}{2}$ -watt resistors. For a 70-ohm bridge use 100 ohms,  $\frac{1}{2}$  watt. It is very important that the resistors used be composition or carbon, not wire-wound.

The leads to  $S_1$  are brought out of the Monimatch box through two feed-through insulators and run from there to the switch in shielded wire.  $M_1$  as shown is a 500- $\mu$ a. meter, but any microammeter, or even a 0-1 milliammeter, can be used.

### Adjustment Procedure

The transmatch can be used with practically any antenna system. With balanced feed, the

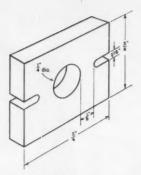


Fig. 3—Dimensions of the insulating spacers used to hold the pickup wires in place in the Monimatch.

feeders should be connected to terminals  $J_3$  and  $J_5$ . A coax line from the antenna should be connected to  $J_4$ . For single-wire feed, such as a long wire or random-length wire fed at the end, the feeder should be connected either to  $J_3$  or  $J_5$  and the transmatch chassis grounded to an earth ground.

Connect a length of coax between the transmitter and the transmatch, using either 50- or 70-ohm coax, depending on which value you built the Monimatch to handle. Feed some power through the system and set  $S_1$  to read forward power. Adjust  $R_3$  for a full-scale meter deflection. Next, set  $S_1$  to read reflected power and tune  $C_1$ and  $C_2C_4$  for minimum reading. You may not be able to get the reading down to zero (that's what you're shooting for), so try a different setting of  $C_3$  and again adjust the other two controls. Once you get the zero reading the transmatch is correctly adjusted for that particular frequency. Make a note of the settings and then proceed to the next band. If you keep an accurate record of all control settings it will be a simple matter to change bands quickly.

If you should encounter an antenna system that cannot be matched, although this is unlikely, the simplest thing to do is to increase or decrease the length of the feeders. A little experimentation will quickly set you up with a "matched" condition.

### Strays



During the course of Ohio Radio Amateur Week KBJLK set his rig up in a spare office at the Warren (Ohio) Tribune Chronicle. Above, KBJLK works W4TIs at Ft. Benning, enabling a soldier's wife there to talk with a former coworker (standing) and her mother. (Tribune photo)

### • Technical Correspondence

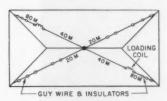
### MULTIBAND ANTENNA

435 Giannini Drive Santa Clara, Calif.

Technical Editor, QST:

I became interested in a mateur radio some months ago and obtained my Novice license. The first copy of Q8T I purchased (April 1961) I found to be most valuable. I constructed an antenna based on the article "Multiband Antennas Using Loading Coils," by W. J. Lattin, and am writing this letter to tell you what excellent results I had.

Since I have a small lot it is impossible to put up a full length doublet antenna for 80 meters. By using loading coils I was able to put up a complete 20-40-80 antenna on my roof top. My antenna is an inverted "V" requiring only one pole. I mounted a thirty-foot pole in the center of the roof and ran the antenna wires diagonally to each corner. The antennas also acted as guys to secure the pole as shown in Fig. 1.



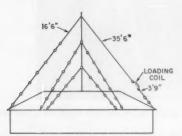


Fig. 1—Multiband antenna using loading coils à la W4JRW for 80–40 meters, for roof-top construction. A 20-meter dipole is added as another leg of an "X." The support is 30 feet high, with additional guying at intermediate points as shown.

A phenolic block was mounted on top of the pole with four closed hook eyes to which the antenna was connected. The antenna was center fed with RG-8/U coax secured to the center of the phenolic block.

The coils were close-wound with No. 18 Nyclad wire on ½-inch-diameter phenolic rods, 14 inches long, A winding length of 12 inches was used. These coils measured 120 microhenries.

The antenna was tested and adjusted with the help of E. R. Smith, W6WRL. The results are shown in the graph, Fig. 2. The antenna was adjusted for resonance on the 80-and 40-meter Novice bands. The 35-foot 6-inch sections of the antenna were adjusted for the 40-meter band and then the 3-foot 9-inch sections were adjusted for the 80-meter band. Resonance on 80 meters was very sharp, only 100 kc. wide. With lengths of 4 feet, resonance was at approximately 3.65 Mc. and with lengths of 3 feet 6 inches, resonance was at approximately 3.8 Mc. No adjustments were necessary for the 20-meter antenna, where 16-foot 6-inch lengths were used.

I am very grateful to W4JRW for his article in April, 1961, QST. Perhaps if my results were published, some

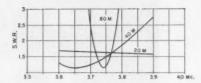


Fig. 2—Standing-wave ratio as measured with a Heathkit AM-2 s.w.r. bridge. Coax line is RG-8/U.

other Novices would benefit by my experience with the antenna.

- Bernard Dzambik, WV6RLZ

### ANOTHER QRM-MAKER

112 W. Prospect St. Northville, N. Y.

Technical Editor, QST:

Have just finished reading George Rand's FB article on mysterious QRN and it reminded me that I was going to share a like experience with the gang and had let it slip out of my mind.

Two years ago when we were living in Wilson, N. Y., we had an apartment over a public garage, so I got used to copying through all kinds of QRN. However, one day a new one came on that blocked out all the bands, so I had to do something about it. It was like a spark coil being keyed at a dot per second, and kept at it day and night. When I found that I could hear it on the car radio I started cruising around and soon determined that the noise was coming from a grocery store on the corner. Instead of barging in and doing some questioning and looking on my own, I decided to let the power company help out, as they are always glad to do. They sent their radioman to look around the store and in a few minutes he spotted the culprit. It turned out to be one of these counter displays that has a swinging arm and is kept moving by a flashlight cell and coil. Every time the contact was made and broken it gave a big kick of r.f.

The grocer was very happy to shut the thing off, as it was bothering his broadcast reception. He hadn't suspected this gadget at all.

this gadget at all.
— Lt. Comdr. W. B. Russell, USNR (R), W2OE

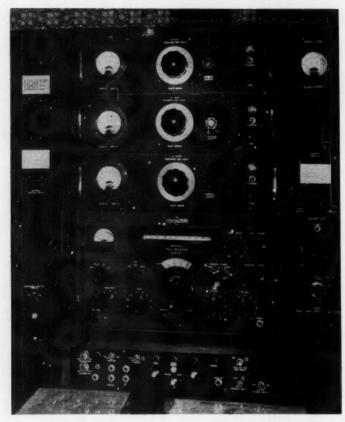
### SHIELDING AND FILTERING

235 South Irving St. Ridgewood, N. J.

Technical Editor, QST:

With the advent of television, the amateur was forced to "rediscover" the principles of shielding and filtering to prevent the radiation of unwanted signals from his transmitter. Although these principles were well known prica to 1950, it was quite a revelation to me to learn that shielding and filtering were known and practiced in 1897. In the primitive days of wireless telegraphy, one major problem was to prevent the signal from the spark transmitter from injuring the receiver. The receiver, in those days, consisted of a glass tube partially filled with metal filings and equipped with electrodes at each end. The passage of r.f. through the filings caused them to cohere, thus changing the d.c. resistance and, through another circuit, producing a signal in the telegraph sounder. In order to prevent the coherer from being ruined by r.f. from the station transmitter, it was protected in ways described below. The first method is described in a patent application filed by Prof. Oliver J. Lodge in 1897; the second in an application filed by Guglielmo Marconi in 1898.

"For the purposes of protecting the coherer from undesired disturbance, therefore, I inclose it, sometimes with all coils, wires, batteries and the like connected to it, in a metallic covering or case, leaving only one or more round holes or short tubes for the collector termi-



The operating position at K9LKA showing linear amplifiers for 10, 15 and 20 meters mounted in a rack above the receiver

# Single-Band Grounded-Grid Linears

BY

Kilowatt Units for

LARRY KLEBER,\* K9LKA

10 Through 80 Meters

A GREAT many amateurs using transmitters in the 75- to 150-watt class have one favorite band. Most of these operators would like more output, but hesitate to buy or build a multiband amplifier for several reasons. Aside from the cost, it just doesn't seem sensible to use an amplifier that will operate on five bands when operation on only one is desired. Even the multiband operator will find plenty of argument in favor of the single-band unit plan. Construction is simplified, usually resulting in less-frequent need for servicing, and servicing when required is much \*922 Whitney Blvd., Belvidere, III.

If you do all of your operating on one band, there isn't much point in building a multiband transmitter. On the other hand, if you are a band-hopper, individual finals requiring little if any adjustment when bands are changed are the ultimate in convenience. Ergo, these grounded-grid units described by K9LKA should have a universal appeal.

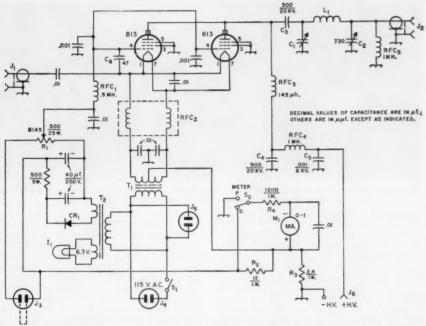


Fig. 1—Circuit used in the single-band high-power linear amplifiers. Capacitors marked with polarity are electrolytic.

Resistances are in ohms and resistors are ½ watt unless indicated otherwise.

C<sub>1</sub>—Transmitting variable, 0.075-inch minimum plate spacing; 103 μμf. for 21, 28 Mc., and 14 Mc., 150 μμf. for 7 Mc., 350 μμf. for 3.5 Mc. (Johnson, 100530/154-14, 150E30/154-8, 350E30/154-10, or similar, respectively).

C<sub>2</sub>—Dual 365-μμf. variable, broadcast-replacement type, sections in parallel (may be necessary to add 330-μμf. transmitting mica capacitor in parallel for 3.5 Mc.)

C<sub>3</sub>, C<sub>4</sub>—Ceramic, TV doorknob type (Sprague 20DK-T5 or similar).

C5-Disk ceramic (Centralab DD60-102 or similar).

C<sub>8</sub>—Ceramic (used for stabilizing in 21- and 28-Mc. amplifiers).

CR<sub>1</sub>—130-volt 75-ma. selenium rectifier (Sarkes-Tarzian type 75).

1-6.3-volt dial lamp.

J<sub>1</sub>, J<sub>2</sub>—Chassis-mounting coaxial receptacle (SO-239).

Ja—Recessed a.c. connector, male (Hart & Hegeman 80329; takes type 80325 female cable connector. Standard female outlet with male plug may also be used).

J4-Chassis-mounting a.c. plug.

easier to handle. No single unit represents a major construction project, and bandswitching can be much less complicated.

Each of the single-band grounded-grid linears shown in the photographs uses a pair of 813s in parallel to provide a one-kilowatt power capability. The tubes, with the screens grounded, operate as high- $\mu$  triodes, thereby eliminating the need for a screen supply. Operating Class B, the efficiency of the tubes will run between 65 and 70 per cent in s.s.b. or c.w. service.

J<sub>5</sub>—Miniature a.c. receptacle (Cinch-Jones 5-302-AB or similar).

J<sub>6</sub>—High-voltage connector (Millen 37001).

 $L_1 = 3.5$  Mc. = 16 turns No. 12  $2\frac{1}{2}$ -inch diam., 6 t.p.i. (B & W 3905-1 stock).

7 Mc.—Same as above, 9 turns.

14 Mc.—10 turns ¼-inch copper tubing, 1½ inches i.d., turns spaced ½ inch.

21 Mc.—Same, 7 turns spaced 3/16 inch.

28 Mc.—Same, 4 turns spaced 1/4 inch.

M<sub>1</sub>—D.c. milliammeter, 3-inch. R<sub>1</sub>—Wire-wound control (Ohmite H-0156).

R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>— Meter multiplier resistors, wire-wound, 5 per cent. RFC<sub>1</sub>—0.5-mh. r.f. choke (National R-300).

RFC2-Bifilar filament choke (B & W FC-15 or similar).

RFC<sub>3</sub>-Plate choke (National R-175-A).

RFC<sub>4</sub>, RFC<sub>5</sub>-1-mh. 300-ma. r.f. choke (National R-300).

S<sub>1</sub>—S.p.s.t. toggle switch. S<sub>2</sub>—S.p.d.t. slide switch.

T<sub>1</sub>—10-volt 10-amp. filament transformer (Merit P-3146, Stancor P-6461 or similar).

T<sub>2</sub>—Power transformer: 125 volts, r.m.s., 50 ma.; 6.3 volts, 2 amp. (Thordarson 26R38, Stancor PA-8421).

Costwise there is quite a spread. If you're willing to scrounge around, raid the junk box and do some horse trading, you can build each unit complete for less than \$30. If you buy all the parts new, the cost will be approximately \$60, excluding tubes.

### The Circuit

The r.f. driving power is fed to the filaments of the two 813s through a 0.01- $\mu$ f. ceramic capacitor, as shown in Fig. 1. The filament



All amplifier units have the same panel design. This unit is the one used for 20 meters. Tuning and loading controls are at the center. The small knob in the lower right-hand corner is for adjusting bias.

transformer is isolated from r.f. by the bifilar filament choke  $RFC_2$ .

A built-in supply delivers 0 to 37 volts of bias to the control grids of the 813s, the value being determined by the setting of  $R_1$ . With the terminals of  $J_3$  open, the voltage rises to -168, biasing the tubes beyond cutoff, and no plate current will flow. Shorting  $J_3$  reduces the bias to the value selected by adjustment of  $R_1$ . Leads from  $J_3$  should be run to relay contacts, such as auxiliary contacts on an antenna relay which close while transmitting. Cutoff bias on stand-by eliminates the "hash" which often bothers reception, especially when using a tr. switch.

High voltage is fed to the 813 plates through  $RFC_3$  and  $RFC_4$ . A 500- $\mu\mu$ f. 20-kv. doorknob capacitor,  $C_3$ , is used to isolate the high-voltage supply from the pi-network circuit. The rating of  $RFC_4$  is only 300 ma. but, since the plate current swings up to 400 ma. only on peaks, the rating of this choke is satisfactory.

The two-section variable output capacitor  $C_2$ , with a total maximum of 730  $\mu\mu$ f., eliminates the need for a tap switch and fixed capacitors. The pi-network output of these linears is designed to feed 50- to 70-ohm unbalanced loads.

To obtain separate grid- and plate-current readings, meter  $M_1$  is switched across multiplier resistors  $R_2$  and  $R_3$ , respectively. Since the grid circuit is returned to the center tap on the filament transformer, only plate current is read in the PLATE position of  $S_2$ .

### Chassis Assembly

The panel is a standard 5½ × 19 × ½-inch aluminum rack-style unit, while the chassis is made up of a pair of See-Zak¹ R45 rails (4 by 5 inches), a pair of R417 rails (4 by 17 inches), and a P517 panel (5 by 17 inches).

First, lay out the P517 panel according to the drilling template of Fig. 2. The rear-view photo will be useful as a check. After locating all holes with a prick punch, drill pilot holes at I and J with a small drill (No. 35 or 36). At this point, mark the outer or mounting side of the P517 panel with a permanent reference mark, such as a file or scribe mark, so that there will be no confusion. Next, place the P517 panel on top of the rear of the rack panel and, after centering it on the rack panel, clamp the two together and transfer the pilot holes at I and J. These are the shaft holes for  $C_1$  and  $C_2$ , so they must match perfectly. Enlarge the two holes in both panels to  $\frac{1}{2}$  inch.

Drill all remaining holes whose sizes are indicated in Fig. 2. Exact sizes are not given for holes at H and K. These are for feed-through insulators and should be drilled to fit the ones you have on hand. Mount the 2-contact Jones

<sup>&</sup>lt;sup>1</sup> SeeZak products are available from Radio Shack Corp., 730 Commonwealth Ave., Boston 17, Mass., Syracuse Radio Supply, Syracuse, New York, and California Electronic Supply, Los Angeles, Calif., among others.

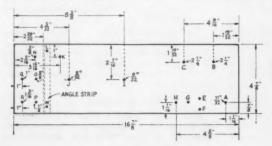


Fig. 2—Sketch showing dimensions and layout of the chassis panel. Lettered points are identified in the text.

socket  $J_{\delta}$  (the a.c. outlet for the ventilating fan) at A.

Cut a piece of ½ × ½-inch aluminum angle 4½ inches long. Using a No. 25 drill, place a hole ½ inch from each end and ¼ inch from the outer edge of the angle. Transfer these holes to the chassis panel at points L and M. Submount the 813 sockets at B and C, using ½-inch spacers. This submounting helps to keep the over-all depth of the amplifier, including the shielding enclosure, to 15 inches or less so that it can be mounted in a standard rack cabinet.

Remove the short ceramic insulator from the mounting bracket of the National R-175A choke,  $RFC_3$ , and mount a 500- $\mu_k$ f. 20-kv. capacitor,  $C_4$ , in its place. Place two solder lugs on the top terminal of this capacitor, and then thread the ceramic insulator onto the capacitor stud. One of the solder lugs is connected to the h.v. feedthrough insulator alongside, while the bottom lead of the choke is connected to the other lug. The 500-μμf. 20-kv. blocking capacitor, C<sub>3</sub>, is mounted on the top of the short insulator of RFC<sub>3</sub>. This conversion may be seen in the rearview photo. Position RFC3 on a line midway between the 813s, and close to the bottom edge of the chassis panel. Scribe points E, F and G (corresponding to the choke mounting holes) and drill with a No. 25 drill. The plate tuning capacitor  $C_1$  mounts at I and the loading capacitor  $C_2$ at J. Cut the shafts of both capacitors so that they extend through the chassis panel ½ inch.

The feed-through insulator at the top of the chassis, between the 813s (visible in the rearview photo), was included in the original 10-meter amplifier to bring out a lead from a neutralizing coil on  $RFC_2$ . After completing the amplifier, it was found that neutralization was not required, so the insulator was not put to use.

Tap two diagonally-opposite holes in the SO-239 coax chassis connectors for  $\frac{1}{4}$ -inch 6-32 screws, and submount them at N (output) and O (input). The Millen high-voltage connector  $J_6$  is mounted at P, with the male a.c. input connector  $J_4$  at R, and the flush bias-control receptacle  $J_3$  at Q.

Remove the outer shell of the filament trans-



The feedback shield described in the text and Fig. 3.

The rear side of the shield is open,

former  $T_1$ . Cut two pieces of  $\frac{1}{2} \times \frac{1}{2}$ -inch aluminum angle to a length of 4 inches, and drill holes to match the two holes that go through the bottom edge of the core. Next, drill a No. 25 hole  $\frac{3}{4}$  inch from each end of both pieces for mounting. Fasten these mounting strips to the transformer core, using the original bolts.

Place flexible couplings on the shafts of  $C_1$  and  $C_2$ , mount the chassis panel on the rails with at least two sheet-metal screws (furnished with the rails) on each side, and one at each end. Before tightening the screws, use a mechanic's or carpenter's square to check the corners. Place extension shafts in the flexible couplings of  $C_1$  and  $C_2$  and then place  $T_1$  in position against the front lip of the chassis and between the extension shafts. Check the clearance carefully, then scribe and drill the mounting holes for  $T_1$ . Place a 1-inch screened vent plug above and to the left of  $T_1$ , as shown in the photographs. Drill four or five 1/4-inch vent holes in the bottom side of the chassis, near the front lip, between  $RFC_2$  and  $T_1$ . and five or six directly above the pilot lamp.

A slight amount of feedback was encountered in the 15- and 20-meter amplifiers. This was eliminated by placing a small shield over the output coax connector and the feed-through insulator connected to  $C_2$ . The shield is cut from sheet aluminum as shown in Fig. 3, and a photo shows the finished product after bending. Notice the  $\frac{1}{2} \times \frac{1}{2} \frac{1}{2}$  when note here are made to clear



Rear view of the 10-meter amplifier. Connectors grouped at the left are for r.f. input and output, a.c. input, stand-by bias control and high-voltage input. The small connector below and to the right of the 813s is for blower-motor power.

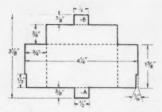


Fig. 3—Sketch showing dimensions of the feedback shield. Bends are made along the dotted lines. See detail photo.

the lip of the chassis rail. Use a ½-inch 6–32 binder-head machine screw through the rail and Tab A, and a ¼-inch No. 6 sheet-metal screw through Tab B into the bottom of the chassis panel. One end of this shield is visible just to the right of the bias transformer in the interior view of the amplifier.

Support the front panel, face down, an inch or two off the workbench. Insert the extension shafts of  $C_1$  and  $C_2$  through the front panel holes and carefully center the chassis on the panel as before. Scribe on the panel an easily-seen mark all the way round the chassis. Remove the chassis panel from the rails and carefully reposition the rails inside the scribed mark on the back of the front panel. Holding the rails in position, use a long scriber or pencil to transfer to the panel the two outside holes on the lips of each end piece. Similarly, transfer the second hole from each end on the long side rails, also the eighth hole from the left-hand end of the bottom rail and the ninth hole on the top rail. Prick punch and drill clearance holes for the 1/2-inch No. 6 sheet-metal screws used to hold the front panel to the chassis. After checking the alignment of these holes, set the front panel aside.

### Wiring

Mount a three-terminal ungrounded tie-point strip midway between  $T_1$  and  $R_1$  and one inch back from the front lip of the chassis. The primary leads from  $T_1$  and  $T_2$ , as well as the leads from  $J_5$ , will be attached to the center and lefthand terminal. One of the 115-volt a.c. leads from  $J_4$  is also attached to the left-hand terminal while the other a.c. lead goes to the right-hand terminal of the tie-point strip. When the front panel is mounted on the chassis, flexible leads will be run from the center and right-hand terminals to the power switch.

The location of most of the remaining components can be determined from the interior-view photo.

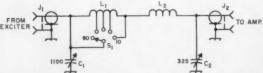
Much of the wiring can be done before mounting the P517 panel permanently on the rails. Use No. 12 wire for the filament circuit. Insulated hookup wire may be used for the bias-supply connections. Attach leads to  $J_5$  that will reach the tie-point strip near the filament transformer. Use bent solder lugs under the heads of mounting screws of  $C_1$  and  $C_2$  to hold the wires in place and keep them from contact with high-voltage or r.f. wiring. Attach 5-inch leads of flexible wire to  $J_3$ and  $J_4$ . High-voltage supply leads should be made with high-tension cable, or with rigid wire well spaced from the chassis and other metal. Attach the chassis panel to the rails with at least 12 sheet-metal screws. Complete the wiring and set the chassis aside.

### The Front Panel

The chrome handles at each end of the panel are Bud No. H9168. Mount them ½ inch from each end and equidistant from top and bottom. You will find these handles to be the perfect answer for lifting the amplifier in and out of its rack mounting. They will also support the full weight of the amplifier, when you have it face down on your workbench for service, thus protecting the controls.

With the panel face up, locate three holes on a vertical line  $2\frac{1}{2}$  inches from the right end as follows: the pilot-lamp hole is  $1\frac{1}{2}$  inches down from the top, the hole for the filament switch is  $2\frac{3}{4}$  inches from the top, and a 5/16-inch hole for the shaft of  $R_1$  is  $1\frac{1}{2}$  inches up from the bottom of the panel. Drill a No. 25 hole 2 inches to the left of the pilot light and  $1\frac{1}{2}$  inches down from the top of the panel. Mount a one-terminal ungrounded tie point on the rear of the panel. Mount the meter with its center  $3\frac{1}{4}$  inches from the left-hand end of the panel and  $2\frac{1}{4}$  inches from the top. The s.p.d.t. slide switch,  $S_2$ , is centered directly below the meter. Place a solder lug on the left-hand mounting screw of  $S_2$ .

The bracket for  $R_1$  is made from a piece of  $\frac{1}{8} \times 1 \times 2\frac{1}{2}$ -inch aluminum or brass. Bend a 1-inch leg for attaching to the chassis and, after drilling two No. 25 holes, mount with the center line of the bracket in line with the 5/16-inch hole in the panel. Leave a  $\frac{3}{2}$ -inch space between the bracket and the panel. Transfer the panel hole to the bracket, drill a 7/16-inch hole and elongate

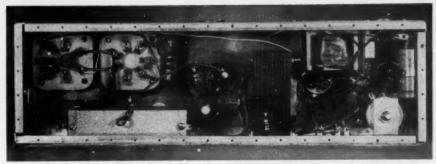


C<sub>1</sub>—Miniature triple-section variable, 365  $\mu\mu$ f. per section, sections in parallel.

C<sub>2</sub>—Miniature receiving-type variable (Hammarlund MC-325-M).

Fig. 4—Pi network for coupling fixed-  
impedance exciters to the grounded-grid  
amplifiers. Capacitances are in 
$$\mu\mu f$$
.

 $J_1$   $J_2$ —Chassis-mounting coaxial receptacle (SO-239),  $L_1$ —17 turns No. 16, 1¼-inch diam., 2 inches long, tapped at 10, 4 and 2 turns from 10-meter end.  $L_2$ —4 turns No. 12, 1-inch diam., 1 inch long.  $L_3$ —Single-pole 5-position ceramic rotary switch.



Interior view of the chassis. The bifilar filament choke is below the 813 sockets. The bias-supply transformer is to the right of the filament transformer, suspended from the top of the chassis.

The bias-control potentiometer is in the lower right-hand corner.

it with a round file to simplify lining up the shaft of  $R_1$  in the panel hole.

After placing the 0.01- $\mu$ f. capacitor across the meter terminals, wire  $R_3$  from the positive terminal of  $M_1$  to the ground lug on  $S_2$ , and ground the terminal of  $S_2$  closest to the lug. Wire  $R_1$  from the negative post of  $M_1$  to the center contact of  $S_2$ . Connect  $R_2$  from the positive post of  $M_1$  to the other terminal of  $S_2$ , and run a piece of No. 18 solid insulated hook-up wire from this switch terminal to the tie point near the pilot light.

The 6.3-volt winding on  $T_2$  can be used for the pilot light. Pass the center-tap lead from  $T_1$  over the top of the extension shaft of  $C_1$  before conceting it to the positive post of  $M_1$ . This will prevent it from coming in contact with the high-voltage lead or the plate choke. Leave enough slack in the leads to the pilot light, power switch and bias supply, so that the front panel can be easily lifted on or off the shafts of  $C_1$ ,  $C_2$  and  $R_1$ .

After soldering these leads, position the front panel and insert the ten No. 6  $\frac{1}{2}$ -inch solf-tapping metal screws. Position a piece of  $\frac{1}{2}$ -inch tubing from the bottom of the 500- $\mu\mu$ f. blocking apacitor, around the nearest 813 to a stator terminal of  $C_1$ . The mounting of  $L_1$  will depend upon the size of the coil which, of course, will vary with the frequency for which the amplifier is being built. The rear-view photo shows the 10-meter amplifier with one end of  $L_1$  attached to  $C_1$  and the other end supported by a stand off insulator. Bud heat-dissipating plate caps are used on the 813s. Copper strap,  $\frac{3}{8}$  inch wide, is used to connect the tube caps to  $RFC_3$ .

to connect the tube caps to  $RFC_3$ .

Use "Tekni-Cals" for lettering. After they are thoroughly dry, use a small camel's-hair brush and flow on lacquer thinner very sparingly. Practice this step on an old panel before attempting to do your finished amplifier panel. When properly done, your lettering will have a decidedly professional appearance.

### Shielding

The shielding enclosure is made of sections of perforated aluminum sheet supported on a framework of  $\frac{1}{2} \times \frac{1}{2}$ -inch aluminum angle stock. The front edges of the shield overlap the chassis on

top, bottom and the left-hand side. The righthand end of the enclosure is fastened to the angle piece attached to the chassis panel.

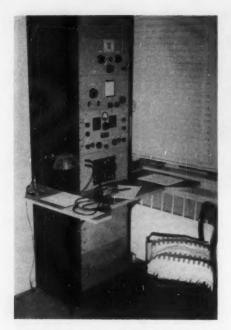
You can order 0.051-inch perforated aluminum sheet and ½ X ½-inch angle stock for the shielding enclosure precut to exact size from Dick's, 62 Cherry Ave., Tiffin, Ohio. Of the perforated sheet, you will need two pieces 11 by 14 inches, one piece 43/4 by 11 inches, one piece 43/4 by 101/2 inches, and one piece 434 by 14 inches. In the angle stock, you will need four pieces 101/2 inches long, two pieces 14 inches, three pieces 5 inches and two pieces 4 inches long. (Order one piece  $31\frac{1}{2}$ , one piece 28, and one piece  $33\frac{1}{2}$  inches long.) The total cost of the perforated sheet is \$4.27, and the angle is \$1.40, plus postage. Use 1/4-inch No. 6 sheet-metal screws for assembly and space them approximately 2 inches all around. The ventilating fan is obtainable from Allied Radio (Cat. No. 72P715). It is mounted against the inside of the rear wall of the shielding enclosure with the axis of the fan exactly opposite the plate caps of the 813s. Before attaching the top of the enclosure, run the a.c. leads from the fan motor along the bottom to the 2-prong Jones socket,  $J_{\delta}$ .

### Adjustment

Check out the bias voltage and filament circuit before applying high voltage. A variable h.v. power supply is definitely recommended. If not available, arrange to insert a 100-watt lamp in series with the primary of the plate transformer while testing. A power supply delivering from 1800 to 2250 volts d.e. at 400 to 500 ma. is ideal. Before applying high voltage, connect a dummy load to  $J_2$ . With a plate voltage of 2000 volts,  $S_2$  in the PLATE position, and the terminals of  $J_3$  shorted, adjust  $R_1$  for 40 ma. of plate current. With carrier injected in the s.s.b. exciter and  $S_2$  in the GRID position, adjust the exciter loading for a full-scale reading on  $M_1$ .

Turn  $S_2$  to plate,  $C_2$  to maximum, and adjust  $C_1$  for minimum plate current. With reduced plate voltage, decrease the capacitance of  $C_2$  for 200 ma. of plate current, maintaining resonance with  $C_1$ . With plate voltage increased to

(Continued on page 162)



# A Rack-Mounted Operating Table

BY JAY F. HELMS,\* W6HHT

ONE of the greatest problems facing any ham is that of arranging his equipment in a comfortable and efficient fashion. Being in the military service and subject to movement from one part of the world to another on short notice, I long ago had settled for installation of all transmitting and receiving equipment in one standard six-foot relay rack mounted on heavy duty casters. This solution, while facilitating movement from one location to another, left a good deal to be desired from the standpoint of operating ease and comfort. This latter problem has been solved with the construction and installation on the relay rack of a writing and operating shelf which is comparable to a desk surface of 30 inches by 42 inches.

This operating shelf can be most economically constructed from a single piece of half-inch plywood 24 inches by 48 inches in size, and can be surfaced with either tempered masonite or formica according to individual choice. The plywood should be cut as indicated in Fig. 1, following the sequence of saw cuts as indicated. Exact dimensions of X, Y and Z are not given as they will vary depending upon the external size of your relay rack. Masonite or formica can be cut to the same pattern and fastened to the plywood with brads or glue. While the model shown in the photograph was constructed with a radial-arm cutoff saw, a comparable job can be done with hand tools if sufficient care is taken. Saw cuts numbers 1 and 4 are most critical; these both must be made exactly parallel with one edge of the plywood sheet if the finished assembly is to fit properly.

<sup>\*</sup>Captain, Signal Corps. Hq. 1st Region ARADCOM, Ft. Totten, Flushing 59, N. Y.

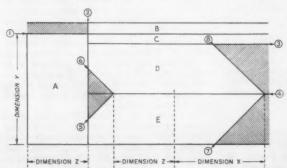


Fig. 1—This layout shows you how to cut the plywood with the least waste (shaded portions). Dimension X is the distance from front to back of the relay rack. Dimension Y is the width of the relay rack. Dimension Z is determined by experiment when you are laying out the saw cuts on the plywood, necessarily being a function of the over-all length of the piece of plywood and the length of dimension X.

Finished pieces are assembled as shown in Fig. 2. Strips B and C are fastened beneath the shelf to insure rigidity. The entire shelf is fastened to the relay rack with three pieces of ½-inch angle bolted across the front and sides of the rack and to which the shelf is attached with wood screws. To provide additional strength for heavy-handed ops, two diagonal braces were added between the front edge of the shelf and the front of the rack; these braces are constructed from ½-inch steel strap and can be seen in the photograph.

When completely assembled and fastened to the rack the shelf is quite rigid and will support any reasonable weight which may be placed on it. Ample space is provided for key, mike, logbook, scratch-pad, lamp and miscellaneous accessories, with sufficient space to permit un-cramped writing and complete access to all equipment. In fact, the completed shelf turned out to be so useful that it was finally trimmed with 12 feet of 3/4 inch flat aluminum strip to conceal the junction of plywood and masonite. In making this shelf, sufficient scrap angle and strap were available in the junk box. If these components need be pur-

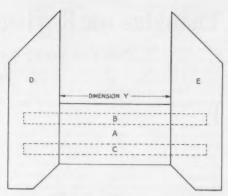


Fig. 2—Here's how to assemble it. Dimension Y is the outside width of the relay rack; it determines precisely the length of piece A and roughly the lengths of pieces B and C.

chased, 4 feet of angle and 4 feet of strap will be required. Total cost of all material purchased in the New York City area was \$7.50.

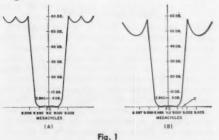
## · New Apparatus

### McCoy Single-Sideband Filters

A COMPLETE "crystal set" for use in constructing a 9-Mc. s.s.b. exciter has been packaged by McCoy Electronics Co., Mt. Holly Springs, Pa. The package contains a crystal filter and two oscillator crystals. Two models of filters are available, the Golden Guardian (Model 48B1) and the Silver Sentinel (32B1). The model 48B1 has an unwanted sideband rejection of better than 55 db., when used in the recommended circuit furnished with the kit. A characteristic curve for this filter is shown in Fig. 1A. The economy line Silver Sentinel has a slightly higher shape factor but still has respectable sideband rejection of about 40 db. Its curve is shown in Fig. 1B.

9-Mc. oscillator circuit for either upper or lower sideband operation. Referring to Fig. 1B, if lower sideband emission is desired, the 9.0015-Mc. crystal is switched into the oscillator circuit. The carrier, which has been suppressed in a previous stage, is at point "X" on the filter slope. When modulation is applied to the system, the lower sideband will be passed through the filter while the upper sidebands will be rejected.

The filter kits come with an instruction pamphlet which includes recommended circuits, technical data and other operating and construction



The two oscillator crystals furnished in the filter kit have frequencies of 9.0015 and 8.9985 Mc. The appropriate crystal is switched in the



# Thoughts on Keying Filters

### Click-Free Keying Without Vacuum Tubes

### BY G. FRANKLIN MONTGOMERY, \* W3FQB

EVERYONE knows what key clicks sound like, and generating them yourself is one way to ruin your reputation with friends and neighbors. Excellent past articles in QST have discussed how to check a transmitter for clicks and how to suppress them. 1-5 When the transmitter is cathode- or plate-keyed, a useful suppression device is a keying or lag filter. Most of the available information on keying filters is only qualitative, however, and the usual filter circuits have some disadvantages. This article describes a better keying filter and formulas for its design.

### Click Suppression

Clicks are generated by any transmitter whose carrier amplitude rises or decays too rapidly. To suppress the clicks, a keying scheme must be used that prevents too fast a transition from "off" to "on" and back again. The modern approach to cathode keying is a separate keyer tube, keyed in its grid circuit. But it seems unwise to use a tube for a job that can be done as well with a simple inductor and capacitor. The preference for keyer tubes may have grown for the following reasons:

Consider the typical filter shown in Fig. 1A (where  $C_K$ , the cathode bypass capacitor, is not large enough to be considered part of the filter). The equivalence is only approximate, because neither the voltage E nor the resistance  $R_0$  is strictly constant, but their variation makes no great difference. The object, of course, is to force the battery (cathode) current to rise slowly when the key is closed and decay slowly when the key is closed and decay slowly when the key is way, but not without fireworks at the key.

### Cause of Arcing

To begin with, suppose that C is omitted. When the key is closed, the initial current is zero. The inductance L prevents the current from increasing abruptly, and the result is a gradual increase in current, the rate of rise depending on the ratio of  $R_0$  to L. When the key is opened, however, the initial effect of L is to maintain the current at its maximum. The contact voltage

\*517 23rd St., N.W., Washington 7, D. C.

Goodman, "Some Thoughts on Keying," QST, April, 1941, p. 17.
 Goodman, "Keying the Crystal Oscillator," QST, May,

1941, p. 10,

<sup>8</sup> Goodman, "Tube Keying," QST, June, 1941, p. 31.
<sup>4</sup> Goodman, "Kay Clicks and Receiver Bandwidths," QST, April, 1950, p. 34.

<sup>5</sup> Goodman, "Keying the Radiotelegraph Transmitter," QST, July, 1956, p. 27.

Occasional pathological causes are incomplete neutralization and parasitic oscillations, but these ought to be fixed anyway. See the listed references.

rises abruptly to a value that may greatly exceed E, and the result is a soft, persistent arc at the kev

If we include C, we can eliminate the arc. Now as the key is opened, the inductor current charges C, and the voltage across C rises slowly toward the value E. But when the key is closed again, it must discharge C before current can begin in L. Typically, E can be 70 volts and C several microfarads, producing a fat, noisy spark at the contacts. (This may partly explain the onetime popularity of keys with contacts the size

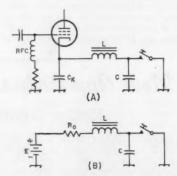


Fig. 1—(A) A conventional L-C arrangement for suppressing key clicks in a cathode-keyed stage. (B) An approximate electrical equivalent of A.

of aspirin tablets.) A resistor in series with either the key or the capacitor will reduce the spark but will not eliminate it. Hence, the dilemma. One way of arranging the circuit treats the key contacts badly on make, the other way on break, and worn key or relay contacts are certain trouble.

### Reducing the Spark

Now look at Fig. 2. The rectifier makes it possible to switch C automatically to the part of the circuit where it will do the most good. Initially, C is charged to the voltage of the open cathode with the polarity shown. When the key is closed, CR prevents the discharge of C through the contacts, the inductor current rises gradually, and C discharges slowly through R and L. When the key is opened, the voltage across the contacts rises gradually as the inductor current charges C through CR. The result is essentially no arc, no spark.

#### Design

If the filter of Fig. 2 is critically damped for

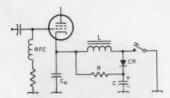


Fig. 2—A diode and resistor connected as shown will minimize sparking at the key contacts, as described in the text. See text for suggested component values and ratings.

both make and break, the cathode current will rise and fall exponentially as shown in Fig. 3. There are two possible sets of LC values for critical damping, but the more useful set is the one that specifies the smaller inductor.

The first step is to calculate

$$R = \frac{E}{I} \tag{1}$$

where E is the key-up potential of the cathode in volts, and I is the key-down cathode current in amperes. Now, if T is the lag time in seconds for the current to reach 95 per cent of its maximum on make, and 5 per cent of its maximum on break, then

$$L = \frac{TR}{10} \tag{2}$$

$$C = \frac{T}{1.8 R} \tag{3}$$

where L is in henrys and C is in farads.

What value for T? This will depend partly on your taste; some people like softer keying than others. A rise (and decay) time of 14 milliseconds (0.014 second) should permit keying at up to 40 words per minute without trouble from overly soft dots. For softer keying, the value chosen for T should be increased accordingly. The values of L and C given by formulas (2) and (3) are not especially critical. It is best to maintain the ratio of L/C that follows from the formulas, but a change in either inductance or capacitance by 20 or 30 per cent from the calculated value will not affect the keying wave-form very much.

Example: I am keying a 6L6 buffer, and I find that the key-up cathode potential is 60 volts, the key-down cathode current 50 milliamperes. A lag time of 20 milliseconds is fast enough for my sending. Then,

$$\begin{split} R &= \frac{60}{.050} = 1200 \text{ ohms} \\ L &= \frac{(.020) \; (1200)}{10} = 2.4 \text{ henrys} \\ C &= \frac{.020}{(1.8) \; (1200)} = \frac{0.0093}{1000} \text{ farads} \\ &= 9.3 \text{ microfarads}. \end{split}$$

I find that I have a 2-henry, 200-milliampere filter choke and an 8-microfarad, 250-volt electrolytic capacitor on hand. These are close enough to do nicely.

Ordinary filter chokes work well in this circuit. The choke should be large enough to maintain most of its rated inductance while passing the direct eathode current. If the keyed current is large, so that the inductance calculated from

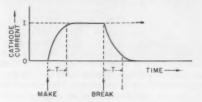


Fig. 3-Typical keying wave shape.

(2) turns out to be inconveniently small, then there is no harm in paralleling two or more chokes to obtain a smaller inductance. Capacitor C must be rated to withstand the key-up cathode voltage. Either paper or electrolytic capacitors will do. Rectifier CR must have a peak-inverse-voltage rating that equals or exceeds the cathode voltage. The average current rating need not be large, because the rectifier passes current only when C is being charged and consequently dissipates little power. Small silicon or germanium power rectifiers are adequate in most cases.

<sup>1</sup> In some instances where the amplifier is operating without fixed bias, the leakage through an electrolytic capacitor may be sufficient to produce a back wave with the key open — Ed.

### Strays 3

 ${
m K@RUA}$  suggests that if you need reference to a back issue of QST, try the library of the local college or university.

Quoting from an AP dispatch: Leonard Dansby sent a fellow ham operator in South Africa some Mexican food recently and received a letter from the man saying "the covering on the tamales was a bit hard on the stomach."

Dansby recalled he failed to advise the man that one doesn't eat the corn shucks in which tamales are wrapped.

W4PK suggests that would-be chess players gather around 7105 kc. and call "CQ chess game."

K8YGN was thumbing through some old *QST*s and happened across a photo of W7YGN. Ten minutes later he heard him calling CQ on 7 Mc.

KN4NWM (David Battle, 3244 Cleveland Ave., Montgomery, Ala.) is trying to get together with former "MARS" operators who served in France and Germany.

# • Recent Equipment -

### Lafayette HE-30 Receiver



The HE-30 is a 9-tube, general-coverage re-ceiver designed primarily for the beginner radio amateur or short-wave listener. It covers the frequency range of 0.55 to 30 Mc. in four bands: 0.55 to 1.6 Mc., 1.6 to 4.8 Mc., 4.8 to 14.5 Mc., and 10.5 to 30 Mc. All of the amateur bands covered by the receiver have electrical bandspread, with a calibrated slide-rule dial marked every 5 kc. on 80 and 40 meters, every 20 kc. on 20 and 15 meters, and every 50 kc. on 10 meters. The 80- and 40-meter bands are tuned in segments, each of which has its own dial scale. On 80 meters the steps are 3.5 to 3.7 Mc., 3.7 to 3.94 Mc., and 3.9 to 4.0 Mc. On 40 meters the ranges are 7.0 to 7.17 and 7.17 to 7.35 Mc. The main tuning pointer must be set to a new spot for each segment. The bandspread dial requires about 11 turns of the knob to cover each segment of the 80and 40-meter bands, 3 turns for 20 meters, 5 turns for 15 meters and 10 turns for 10 meters.

The block diagram in Fig. 1 shows the line-up of the receiver. It starts with a 6BA6 r.f. amplifier,  $V_1$ . The amplifier's input circuits, along with the mixer and oscillator circuits, are all gang tuned from the panel by the MAIN and BAND-SPREAD tuning controls. The r.f. amplifier input circuit can be peaked up with the panel antenna trimmer knob. A separate high frequency oscillator,  $V_3$ , a 6BE6, operates 455 kc. higher than the signal frequency on all bands. These two frequencies are combined in the 6BE6 mixer,  $V_2$ , to give an i.f. of 455 kc.

In the HE-30, a Q multiplier doubles as the

b.f.o. A 6AV6,  $V_4$ , is coupled to the i.f. through stray capacitance when in the c.w./s.s.b. mode and oscillates to provide the b.f.o. signal. The panel control, bfo-q-mult frequency, adjusts the b.f.o. frequency. When operating as a Q multiplier, the 6AV6 circuit is connected directly to the i.f. circuit and provides variable selectivity through the panel selectivity control. The Q-multiplier notch can be moved through the receiver passband with the bfo-q-multiplier frequency control.

Two 6BA6s,  $V_5$  and  $V_6$ , operate as 455-kc. i.f. amplifiers. An i.f. gain control is part of the i.f. amplifier cathode circuits, as is also an S-meter circuit for indicating relative signal strength. The diode sections of a 6AV6,  $V_7$ , function as a detector and noise limiter and provide a.g.c. voltage which is applied to the r.f. amplifier and the first i.f. amplifier. A panel toggle switch allows for grounding the a.g.c. bus if desired. The noise limiter also has an on-off panel toggle switch.

The triode section of  $V_7$  operates as an audio preamplifier and drives a 6AQ5 audio power amplifier. A rear apron terminal strip provides for connecting a low-impedance speaker (either 4 or 8 ohms), and a panel phones jack permits the use of low-impedance headphones. When the phones are inserted in the jack, the speaker connected to the 8-ohm tap is automatically disconnected.

A conventional full-wave power supply furnishes the necessary operating voltages for the HE-30. The primary of the power transformer is

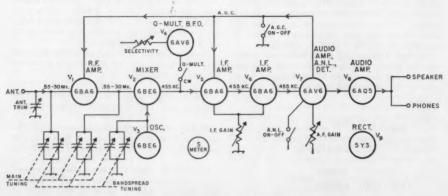
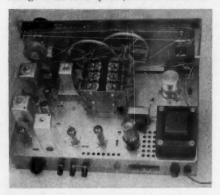


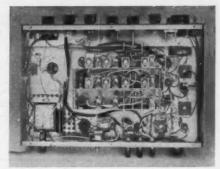
Fig. 1-Block diagram of the HE-30 receiver.

fused and is tapped to permit operation of the receiver at low line voltages.

Operating controls on the panel of the HE-30 include the MAIN and BANDSPREAD tuning knobs, automatic noise limiter on-off toggle switch, a.g.c. on-off toggle switch, ANTENDA TRIMMER, LF. GAIN, BAND SELECTOR, BFO-Q-MULT FREQUENCY, SELECTIVITY, and FUNCTION control. The FUNCTION switch has four positions to select the mode of reception: OFF, BEC - AM, SEND, and Q MULT. In all of the positions except OFF, a.c. power is applied to the receiver. In BEC-AM, d.c. plate voltage is applied to all tubes but V4 (b.f.o./Q multiplier); in the SEND position plate voltage to the r.f. amplifier, mixer and oscillator



The string-drive pulley and cast flywheels visible in this view of the HE-30 are part of the main and bandspread tuning mechanisms. The slide switch just above the power transformer and to the right of the filter-capacitor can is the voltage selector switch which changes the ratio of the power transformer to compensate for low line voltage. Arranged along the rear apron of the receiver from left to right are the auxiliary control plug and socket (for remote control of the receiver), antenna and ground connectors, S-meter zero adjustment, audio output terminal strip (4- and 8-ohm taps), fuse, and line cord.



Bottom view of the HE-30 receiver. The r.f., mixer and oscillator tuned circuits are located in the center area of the chassis.

is cut off. In the Q MULT position, plate voltage is applied to all tubes.

At the rear apron of the receiver is an auxiliary control socket (a mating plug is furnished) for external control of the plate voltage to  $V_1$ ,  $V_2$ , and  $V_3$ .

A 20-page operating manual is furnished with the HE-30 and contains the usual operating and alignment information, a circuit diagram, and parts list. A matching speaker (model HE-11) is available from the distributor. — E. L. C.

### Lafavette HE-30 Receiver

Height: 7 inches.

Width: 15 inches.

Depth: 10 inches. Weight: 21 pounds.

Power requirements: 50 watts, 117 volts,

60 cycles. Price class: \$100.

Manufacturer: Imported. Manufactured

for Lafayette Radio, Syosset 10, New York.

### Collins 30L-1 Linear Amplifier



Although designed as a companion amplifier for the KWM-2 transceiver or for the 328-1 transmitter, the Collins 30L-1 linear amplifier can be used with any exciter capable of furnishing about 70 watts of driving power. It contains its own plate and bias power supplies and is rated at 1000 watts p.e.p. input on s.s.b. and 1000 watts on c.w. (with 50 per cent duty cycle, keydown periods not exceeding 30 seconds). The amplifier is intended primarily for use on the amateur bands, but can be used on nearly any

frequency between 3.4 and 30 Mc. The actual coverage is broken down into five bands: 3.4 to 5.0 Mc., 6.5 to 9.5 Mc., 9.6 to 16 Mc., 16 to 22 Mc., and 22 to 30 Mc.

The block diagram of the 30L-1 is shown in Fig. 1. Part of the switching and control circuits are diagrammed to show how the amplifier can fit into an existing station.

Four forced-air-cooled 811A triodes are connected in parallel as grounded-grid amplifiers. Broad-band pi-network circuits are used to couple

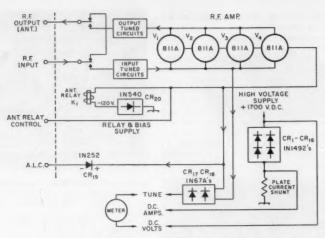
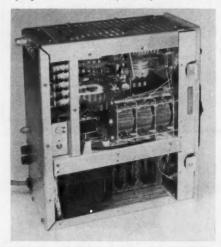


Fig. 1-Block diagram of the 30L-1 amplifier.

the r.f. drive to the amplifier cathodes. These circuits, along with the special length r.f. feed cable furnished with the amplifier, present an almost constant 50-ohm load to the exciter throughout each amateur band. The proper network is switched in by the BAND SWITCH.

The plate circuit of the amplifier is also tuned by a pi network and is adjusted by a Tuning con-



With the cabinet and several cover plates removed, portions of the r.f. and power-supply sections of the 30L-1 amplifier can be seen. Part of the high-voltage power transformer and a power-supply resistor board are at the bottom of the photograph. The ceramic-form inductors used in the amplifier input circuit can be seen in the compartment at the left. The four-gang variable capacitor is part of the amplifier loading circuit. Arranged along the rear of the cabinet (at the left of the photograph) from bottom to top are: line cord, fuses, ground stud, type N antenna connector (left), a.l.c., r.f. input.

and antenna relay jacks.

trol on the front panel. A four-gang variable capacitor, adjusted by the panel loading control, matches the amplifier to the load. The circuit is designed to work into a 50-ohm load. The input circuits, the tapped pi-network inductance in the plate circuit, and the four-section loading capacitor are all switched by the BAND SWITCH to give the proper values for each band.

All operating voltages for the 30L-1 are furnished by two built-in power supplies. Plate voltage is supplied by a full-wave voltage-doubling rectifier circuit which incorporates fourteen semiconductor diodes. Voltage from this section is about 1600 volts under load. A half-wave power supply furnishes about 120 volts negative as blocking bias for the 811s during stand-by. This supply also furnishes power for the changeover relay,  $K_1$ . Primary power for the amplifier can be either 117 volts or 230 volts and is controlled by a front panel on-off switch. The amplifier can be operated at line frequencies of 50 to 400 cycles but operation from frequencies other than 50-60 cycles requires an auxiliary 60-cycle supply for the cooling-fan motor.

Metering circuits in the 30L-1 provide for a Tune position and measurement of d.c. volts and d.c. amps. These are all selected by a front panel Meter switch. In the d.c. volts position, the meter is connected as a d.c. kilovolt meter; in the d.c. amps position, the meter indicates the power amplifier plate current.

In the TUNE position, the meter is part of a bridge circuit (see Fig. 2) and will read zero (the meter has its zero point about one third the way up the scale) when the plate circuit tuning and loading are adjusted properly. This is accomplished by comparing the relative r.f. input and output voltages. By preadjustment of the bridge voltage dividers, these voltages will be equal when the amplifier is properly tuned and loaded. The input voltage is obtained through a capacitive voltage divider from the cathode circuit of the

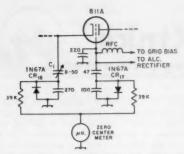


Fig. 2—Diagram of the bridge used in the TUNE position of the meter circuit in the 30L-1 amplifier. Resistances are in ohms, capacitances are in  $\mu\mu f$ . The calibration capacitor,  $C_1$ , is set at the factory and is adjusted so that the meter reads zero when the amplifier tuning and loading controls are adjusted to present the proper load impedance to the power amplifier plates (if this scheme is used in other equipment, an oscilloscope should be used when adjusting the amplifier before the calibration capacitor is set).

811s. Output voltage is sampled through a divider consisting of fixed capacitors and the tube grid-to-plate capacitance. Diodes  $CR_{17}$  and  $CR_{18}$  rectify the voltages for use in the bridge circuit.

An automatic load control circuit provides a negative d.c. voltage to control the grid of a low-level r.f. amplifier tube or tubes in the external exciter. The negative voltage is obtained by rectifying r.f. voltage from the output divider mentioned above.

Connections at the rear of the 30L-1 include the just-mentioned a.l.c. jack and an antenna relay control terminal which, when grounded, closes the antenna relay, K<sub>L</sub>. During stand-by periods, when the relay is not energized, the relay voltage is applied as blocking bias on the amplifier tubes. The r.f. input jack and r.f. output connector also terminate at the rear of the cabinet. As shown in Fig. 1, if the amplifier power should fail, the antenna relay will open and power from the exciter will automatically be fed through to the antenna.

The 30L-1 cabinet is finished in the same blue-gray tones used for other Collins equipment. The instruction manual contains drawings and instructions for connecting up and using the amplifier, but seems to fall short (as most Collins instructions manuals seem to do) on trouble shooting information.

— E. L. C.

### Collins 30L-1 Linear Amplifier

Height: 6% inches. Width: 14¾ inches. Depth: 13¾ inches.

Weight: 38 pounds. Power requirements: 230 volts, 3-wire single phase at 5 amperes, or 117 volts at 10 amperes, 50-400 cycles.

Price class: \$500.

Manufacturer: Collins Radio Co., Cedar Rapids, Iowa.

### NEW BOOKS

Magnetic Amplifiers, by Paul Mali. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 101 pages, including index, 5½ by 8½ inches, paper cover. Price, \$2.45.

Radio amateurs will probably never have any contact with magnetic amplifiers in their hobby, but for those generally interested in the subject, principles and applications of these devices can be obtained from this book. Basic in nature, the manual answers the questions, "what is a magnetic amplifier?" "how does it work?" and lists some of the common applications of magnetic amplifiers in amplification, control switching, memory and computation. Nonmathematical and loaded with illustrations, this is a good beginner's manual on the subject.

Basic Carrier Telephony, by David Talley. Published by John F. Rider Publisher, Inc., 116 W. 14th St., New York 11, N. Y. Pub. No. 258, 176 pages, 6 by 9 inches. Price, paper cover \$4.25; cloth cover \$5.75.

Those who were interested in "wired wireless," which was used in amateur circles during World War II, will find that this book covers the subject of carrier telephony completely. Carrier telephony means the transmission of several signals over a radio circuit, cable, or wire line. This book goes into carrier telephony circuitry and discusses special types of modulators, carrier controls, and awitching. Other chapters deal with voice channel in four-wire carrier terminals and two-wire carrier channel operations. One chapter is devoted to cable carrier systems and another to carrier applications

to radio systems. The book seems to have been directed to telephone and radio engineers, yet it is in the realm of the technician and radio amateur.

Alternating Current Electricity, by Alexander Efron. Published by John F. Rider Publisher, Inc., 116 West 14th St., New York 11, N. Y. 5½ by 8½ inches, 104 pages, paper cover. Price, \$2.25. Basic Science Series, Cat. No. 200–10.

More an electrician's than an electronics manual, this book begins with the basic concepts of a.c. The sine wave, cycle, frequency, and period are developed, and the meanings of instantaneous and r.m.s. values are discussed. The components of an a.c. circuit, resistance, inductance and capacitance, are covered, as well as vector diagrams, a.c. measuring instruments, polyphase power, the transformer and a.c. motors. The book closes with an appendix devoted to the "j" operator and the complex number method of describing and solving a.c. circuits. All chapters are terminated with questions and problems for self examination.

Tubes and Circuits, by George J. Christ. Gernsback No. 82. Published by Gernsback Library, Inc., 134 West 14th St., New York 11, N. Y. 192 pages,  $5\frac{1}{2} \times 8\frac{1}{2}$  inches, paper cover. Price, \$3.45.

With such a general title this book could cover just about any phase of vacuum tube application. Actually, it does cover generally the entire scope of electron tubes and the circuits in which they are used. The theory of electronics, vacuum tube characteristics and applications, vacuum tube amplifiers and oscillators, multipurpose tubes, gas tubes, photoelectric emission and industrial tube applications are a few of the topics included. Down to earth, with little mathematics, this manual will be of interest to technicians at any level.

— E. L. C.



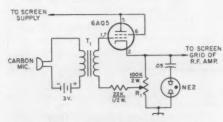
# ints and Kinks

For the Experimente:

### THE SIMPLICITY MODULATOR

THE modulator shown in Fig. 1 is an inexpensive means of converting a c.w. transmitter to a type of carrier-control a.m. transmitter. The system incorporates ease of adjustment, simplicity, and versatility, while providing an effect similar to carrier-control systems using only one tube and one adjustment. Operation is practically foolproof and it can be applied to practically any transmitter.

The c.w. transmitter need only meet the following requirements: Tetrode or pentode final amplifier, and separate oscillator and final with adequate isolation (to reduce frequency shift). Some transmitters use a single tube for an oscillator and final, and these must be changed to incorporate a separate oscillator before the modulator can be used.



rig. 1 - The Simplicity Modulator. Capacitances are in μf. resistances are in ohms R<sub>1</sub>-100,000-ohm 2-watt variable resistor.

T1-Carbon mike-to-grid transformer (Triad A-1X).

The audio amplifier used to drive this modulator is not required to furnish much power. Practically any audio amplifier, such as one salvaged from an old radio, TV or phonograph, will work. With a carbon mike, only one stage of amplification is needed.

To adjust the simplicity modulator, load the transmitter for maximum c.w. output. Record the plate current reading and divide this value by 2. Connect the output of the modulator to the screen grid of the r.f. amplifier tube. Apply highvoltage power and adjust the variable resistor  $R_1$  until the transmitter plate current is the value of the original plate current divided by 2. The plate current should increase with modulation and the neon modulation indicator should flash on modulation peaks.

Have a friend check the sound of the modulation or use a scope to adjust the audio amplifier for the best audio level. It may be necessary to lower the transmitter plate current another 10 or

15 ma. to obtain better audio quality. Power for the modulator may be obtained from the original screen supply, providing there is not too much variation in voltage with modulation. This system is not difficult to use, but some experimentation may be necessary. The screen bypass capacitor of the r.f. amplifier tube should be about 0.002 uf.

If a carbon mike is used, it would be best to employ a d.p.s.t. switch to connect the mike circuit and to key a relay which would turn on the high-voltage power. If a heavy switch is used to do this, the relay may be unnecessary. If a push-to-talk mike is used, a relay must be keyed by the mike switch to turn on the high-voltage power.

From The Carrier, by John Solman

### TUBELESS MINI-KEYER

EXCEPT for a weight control, the circuit in Fig. 2 is basically similar to the Corkey, QST, November, 1950, but is considerably simpler. The operation is as follows: When the key is moved to the dot position, C2 charges and, at the same time, the relay  $K_1$  closes. When the relay closes, it breaks the circuit to  $C_2$ , which then discharges through the relay coil and  $R_1$ . When  $C_2$  discharges to a certain value, the relay will drop out, completing the dot to the keyed

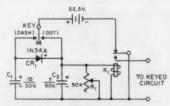


Fig. 2-VE1OI's tubeless keyer. K1-10,000-ohm sensitive plate relay. R<sub>1</sub>-50,000-ohm linear potentiometer.

circuit. When the key is moved to the dash position,  $C_1$  charges and diode  $CR_1$  conducts, connecting  $C_2$ , which also charges up. The same cycle as explained in the dot position is repeated for the dash, except that the delay is longer due to the higher value of capacitance. The circuit is self-completing and  $R_1$  provides a speed control for a range of about 10 to 45 w.p.m. C1 and C2 should be selected for the correct dash-to-dot ratio with the particular relay used. A sensitive relay must be used, or very large values of capacitance will be required for  $C_1$  and  $C_2$ .

# SIMPLE GROUND PLANE

A GROUND-PLANE antenna capable of handling a full kilowatt can be constructed, using wire elements, for less than five dollars. The secret lies in the use of the familiar type SO-239 coaxial connector. Simply turn the connector upside down (the center terminal pointing up) and solder the vertical element to the terminal. See the sketch in Fig. 3. The four radial wires are soldered to the four holes in the connector and the feed line with a mating connector is plugged into the SO-239.

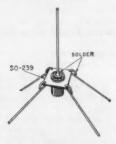


Fig. 3—Ground-plane antenna made from an SO-239 connector.

For v.h.f. ground planes, the antenna can be made self-supporting and can be mounted by attaching the feed line to a supporting mast. Low-frequency models will require an insulator at the top of the vertical element. The antenna is then suspended from a tree. The radials will also require insulators and guy wires. The radials should "droop" at about 45 degrees in order to obtain a reasonably good 50-ohm match. The lengths of the elements can be found from the formulas:

Vertical element in feet = 
$$\frac{234}{f(\text{Mc.})}$$
  
Radial elements in feet =  $\frac{240}{f(\text{Mc.})}$   
- George Christakes, K9MDE

# 12 VOLTS FROM 6-VOLT

The circuit in Fig. 4 depicts a reliable method for obtaining 12 volts d.c. from a car that has a 6-volt system. The second battery should be of equal ampere-hour capacity and in about the

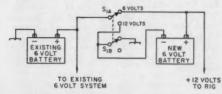


Fig. 4—Method for obtaining 12 volts from a 6-volt system. S<sub>1</sub> should have a high current capacity.

same electrical condition as the original car battery. Domestic house-entrance service wire of number 2 size will suffice for the leads, and a high-ampere toggle switch, such as the Cutler Hammer No. 8905K662 (35 amp., 15 volts), can be used for the charging switch,  $S_1$ . The switch should be mounted so that it can be conveniently manipulated while in motion. For positive ground systems, reverse the polarity of the batteries. The reliability of this system is excellent, as I have used the scheme for about five years in my Volkswagen.

Vic Ortegren, W6WFR

# PLATE CAP CAUTION

Tubes, such as the popular 7094, can be easily broken while you're trying to remove the plate cap. This happens when the set screw on the cap flattens the sleeve on the projecting pins from the tube, making removal of the cap difficult. If you drill out the plate cap with a 5/32-inch drill, there will be plenty of clearance for easy removal.

— Bill Frankart, W9KPD

# SURPLUS 274N RECEIVER NOTE

I have converted several 274N receivers and have found that a large percentage of these receivers have defective capacitors—the large triple section .05-µf. jobs. I suggest that anyone who is going to modify this equipment automatically replace these capacitors with disk ceramic units to save headaches later on.

- Dick Walker, W2MNY

# STIFF MOBILE MOUNT

The accompanying photograph shows my double spring mount which almost completely eliminates antenna side-sway at high speeds.



W5UFO's stiff spring mount.

Even the front-to-back motion of the antenna is minimized, yet it does allow some give, in case the antenna strikes a tree limb or other object. The two springs are mounted side by side between two steel plates to which the antenna and bumper mount are attached.

- Thomas H. Earnest, W5UFO

(This is, no doubt, the original Unidentified Flying Object. — Ed.)

**AUTOMOBILE SYSTEM** 



This is the kind of destruction the AREC was up against. Houses off foundations, streets blocked or caved in, wire lines down, debris everywhere—even the mobiles had a hard time getting to where they were needed.

# A Night of Tragedy

# How Amateurs Helped in West Virginia's Flash Floods

BY WILLIAM R. GARY\*, K8CSG

Assive flash floods, resulting from over five inches of rainfall in four hours, struck Charleston, West Virginia, during the night of July 19, 1961. Complete devastation, indescribable human misery, 22 known deaths, and destruction of property in excess of five million dollars; these were the results of the worst disaster in the city's history. Garrison Ave., Wertz Ave., Kanawaha Two Mile, Elk Two-Mile, Campbells Creek and other narrow residential mountain hollows in the Charleston area suffered virtually complete devastation. Nine persons were killed on farmon Avenue alone. One family living on Elk Two-Mile Greek lost all four of its children. This was the tragedy for which the Kanawha County matter Radio Emergency Corps was alerted.

At 11:30 P.M., Kanawha County Emergency Coordinator K8CSG was roused from sleep by a call from the local Red Cross director. The initial request for only "three mobile units on standby" reflects the speed with which the tragedy unfolded. By 11:35, four operators with mobile equipment (W8TVO, W8VMP, K8CSG, and K8DZU) were ready for action. W8TVO, Assistant Emergency Coordinator, took over the job of alerting operators when commercial power failed at K8CSG.

Red Cross officials increased the number of units requested at five minutes past midnight. The first mobile units were dispatched at 12:10 A.M. WSTVO activated the emergency net on

\*Emergency Coordinator, Kanawha County, W.Va., 1204 Crown Dr., So. Charleston, W.Va.



3890 kc. at 12:15. He was relieved for mobile duty at 12:25 by W8CLX, who served as net control station throughout the remainder of the emergency period.

Between telephone calls, K8CSG dried the rain-soaked ignition on his generator and joined the net on emergency power at 12:40 A.M. Other mobile and fixed stations joined the net as the first hour of the emergency passed.

Mobiles fanned out to the disaster areas, reporting conditions and problems to Red Cross and police headquarters via units stationed at those key locations. Initial reports reflected the gravity of the situation and additional mobiles were called out for duty. The first fatalities were reported by amateur mobile units. Police and military authorities cooperated in granting pasage through roadblocks; amateur vehicles were easily identified by their whip antennas and callletter license plates. Shortly after 2:00 A.M., KSCSG joined WSCLX at the net control station.

During the next few hours, at the request of police officials, several amateur operators carried police officers with them to help expedite surveying and reporting of damage. Police activities were directed by Captain Van Brown, ex-W8WCE. A portable station, K8MNF/8, was established inside police headquarters. Numerous fixed stations in the net assisted by making many telephone calls to local city government and utility officials. Countless reports of broken power and gas lines were relayed from the stricken areas in this manner.

Mobile units effectively furnished city and Red Cross officials with reports of conditions, damage, casualties, and requests for aid. Rescue teams were routed into stricken areas by routes located and reported by the mobile units. Several temporary roadblocks were established by the mobileers who discovered hazardous street conditions.

KBMNF operated both portable and mobile, and was the call used by the station set up inside police headquarters.

QST for

As the night wore on, a pattern became established. Mobile units maintained contact with city and Red Cross officials, scouted the disaster areas, and furnished radio communications to the centralized relief stations which were established. Fixed stations continued to monitor the frequency to relay messages, make phone calls, and guard the emergency net frequency. Net control station W8CLX, manned by K8CSG and W8CLX, coordinated and directed the activities of the amateurs on frequency.

Many stations outside the Charleston area called into the net to inquire about conditions and offer assistance. However, cooperation by all amateurs on and near the emergency frequency was outstanding. As result, it was not necessary to ask FCC to clear the frequency. Members of the Graveyard Net moved their entire net to another frequency to avoid interfering with

emergency activities.

As daylight came, the extent of the disaster became even more evident. Dazed victims wandered aimlessly among what had been their homes. In many cases, nothing remained but broken foundations. Friends and relatives living outside the hardest-hit areas began to ask about the location and condition of persons known to have been in the flood. Telephone calls swamped the switchboards of newspapers, radio stations, and the relief agencies. Commercial radio stations, receiving information from amateurs in the emergency ret, broadcast countless requests and appeals for information on persons missing and feared dead. Numer or amilies re known to have been cunited to this manner. Other stations accepted messages for relay through the National Traffic System, advising families and friends in other cities and states of their wellbeing. In addition to supplying communications, several of the mobileers performed more unusual chores. One amateur rushed baby bottles and nipples to a relief center. Another, K8BIT, delivered gallons of hot soup to a feeding center while enroute to another assignment.

K8ELE, director of a church camp located 55 miles from Charleston, joined the net to advise Charleston families that no damage or casualties resulted from storms in the camp area. Information about casualties was also furnished him to help reassure worried children in the camp. K8PJS and K8PJC, a father and son team at Hinton, West Virginia, performed a similar chore

for a camp in Summers County.

Finally, at 1:12 p.m. on July 20, officials decided that the over-all situation, including communications, was such that the amateurs could be released. Many of those participating in the operation were active continuously throughout the 12 hours and 57 minutes of net operation. Most had little, if any, sleep; several had not gone to bed when the emergency was declared. Of vital significance was the equipment reliability experienced throughout the operation. No breakdown of equipment occurred, although several automobile batteries became completely discharged by heavy usage.

# November 1961



The boss and the assistant boss. K8CSG (left) and W8TVO are EC and Asst. EC respectively for Kanawha County. Together they organized the AREC group and activated it for this emergency.

Nineteen amateurs actively contributed to the effort in the Charleston area: K8s BIT, CSG, DZU, GLH, HID, MNF, MNG, MQB, MOS, NYE, PPW, PQC, SJG, W8s CLX, MLX, PQQ, TVO, VMP, VYI. Ten mobile units saw service. Countless other amateurs were available and ready if their services had been required. Additionally, numerous stations out in the state called in with reports from their areas.

Red Cross and other officials expressed their deep appreciation for the willingness and effiolency of the amateur. In a newspaper story, one ted Crost volunteer described the this manner: "When I wasn't be answer her the phone, I acted as a sort of messenger from the Red Cross headquarters to the mobile unit outside. The 'mobile unit' was a ham radio operator who pulled his radio-equipped car up in front of the headquarters and stayed there for 15 hours, taking and giving messages to make the Red Cross an effective disaster unit. He was amazingly proficient, and I don't see why he didn't suffocate sitting there in his car with the windows rolled up. I don't know his name - there wasn't time for even casual introductions." This was W8VMP who, just two weeks before, was honored as West Virginia's Amateur of the Year.

K8BIT and his XYL, K8MQB, were the first outsiders to get to Elk Two-Mile, the hardest hit area. They operated from this point using both portable and mobile equipment.



# A Novel Idea for Radio Clubs

Home-Built Gear and Home-Grown Ideas Featured by the Amateur Radio Technical Society of St. Louis

BY WILLIAM F. JOHNSON,\* KØABK

In December, 1958, a small group of amateurs of the St. Louis area met to discuss and attempt to solve a problem that plagues many radio clubs: how best to utilize the time spent in club meetings for maximum enjoyment and benefit to all. With many years' experience in the game between them, they were convinced that club meetings need not be boring, or a waste of time, as meetings so often tend to be. Out of this discussion came the Amateur Radio Technical Society of St. Louis, dedicated to increased enjoyment of the hobby through full sharing of experience, knowledge and fellowship—combined with an absolute minimum of time-consuming parliamentary maneuvering.

The foundation of the club is the sharing of technical know-how. Meetings are held in members' homes on a rotational basis, and the primary feature of each meeting is a technical talk and demonstration provided by the host of the evening. Lectures may vary from purely theoretical subjects to demonstrations and explanations of equipment the host has constructed. There is no requirement that the gear under discussion be the result of an entirely successful

project; if it doesn't work quite as it should, or if he has encountered design or mechanical problems, his meeting is the ideal occasion to find help and encouragement.

The club has but one officer, the secretarytreasurer, whose primary duty is the handling of the small amount of business of an ARRLaffiliated 100-percent ARRL club. The host for the evening serves as president pro tem, an "honor" that carries with it the grave responsibility of providing refreshments during the ragchew session that concludes all meetings. The "business" portion of the meeting is limited by the by-laws to 45 minutes, and it has but one regular and important feature: the activity report of each member. Each must describe his ham activity since the last meeting, including operating, experiments conducted, equipment built or tested, and any other information of interest to active amateurs. This feature has always been popular with the group, and it serves to bring them closer together through sharing of common interests and a knowledge of the activities of other members.

Dues are collected once a year. They are small by comparison with those of most clubs, and they are used mainly to finance picnics or other social affairs for members and their families.

Membership is necessarily limited, so that the host may accommodate the meeting in his home without undue hardship, and secondly (and perhaps most important), to keep from having too long an interval between a member's serving as host and technical speaker. The principal requirement for membership is a genuine interest in (not necessarily a knowledge of) the theory, design and construction of one's own amateur radio equipment.

The applicant must appear at a meeting with a piece of ham gear he has built himself, demonstrate it and explain its operation, and stand oral examination by the entire membership. This may pertain to his amateur activities and interests in general, as well as to the equipment he has

\* 225 Blanche Drive, St. Charles, Mo.



Bill Johnson, KØABK, Andy Roewe, WØIFC, and O. J. McQuigg, WØQHL, prepare an exhibit of ham gear built by members of the Amateur Radio Technical Society. Equipment ranges from exact duplicates of QST or Handbook gear to original designs for frequencies from 3.5 to 1300 Mc.



In a typical ARTS session in the basement shack of WØIFC, he demonstrates his "V.h.f. Corner" to WØQHL and KØHZW. Andy is adjusting a 220-Mc. transmitter. In the rack alongside is a 50- and 144-Mc. rig with a pair of 4-65As in the final.

shown, the objective being to determine whether he has a real interest in improving himself and others through the acquisition and sharing of technical skills. Lack of technical knowledge is of no importance, for we know that this will come in time if a sincere interest is demonstrated.

As any club should, the Amateur Radio Technical Society has plans for the future. We propose to take a more active part in ARRL-sponsored programs. Exhibitions of equipment we have designed and built are planned, to encourage greater interest in the technical aspects of our hobby on the part of others. A series of colored slides depicting our program and activities is being made, for loan to other interested groups. But we feel that proficiency in our hobby through a better understanding of its technical society.

<sup>1</sup> Such an exhibition was a feature of a recent general meeting of hams of the St. Louis area, at which QST's v.h.f. editor, Ed Tilton, W1HDQ, was the principal speaker.



Activities run to the v.h.f. bands, but lower frequencies are not neglected. Here KØABK admires the handiwork of WØQHL, a 4-65A transmitter that covers all bands from 6 to 80 meters. It features plug-in subassemblies, a gang-tuned exciter, and high-level audio filtering and clipping.

nical angles must always occupy the top spot in our endeavors.

On-the-air activity by members runs largely to the v.h.f. bands, as these are logical territory for home-designed and home-built equipment projects, but the lower bands are used part of the time by several of the group. A 220-Mc. transmitter designed by W@IFC, and built as a club project, has stimulated interest in that band, and a club net operates each Monday night at 2000 local time, on 222.4 Mc.

All members of the Amateur Radio Technical Society agree that the club has increased their pleasure derived from the hobby, and that the increased technical skills resulting from the program outlined constitute an immeasurable dividend from time that might largely have gone wasted on club activities of less permanent value.

# Strays 3

W2ODO called CQ and was answered by W4ODO — turns out they are both employed by the Navy's Bureau of Ships.

Floyd Clymer of Los Angeles is rather well known for publishing books on automobiles, but now he has come along with a Pictorial Album of Wireless and Radio, 1905–1928, written by Harold S. Greenwood, W6MEA. The 200-odd pages are chock-full of photographs of all sorts of old-time radio gear, all of which is the personal property of W6MEA. For the fellow who wants to reminisce about the gear he had in the good old days, or for the young squirt who wants to see what the equipment was like 50 years ago, this \$3.00 book makes interesting reading. And if you send your order directly to W6MEA (2341 Maryland Ave., Arcadia, Calif.) he'll send you a personally autographed copy.

# New Apparatus National Coup-Links

The photograph below shows a new type of shaft coupling made by the National Radio Company, Inc., Melrose 76, Mass. This simple but effective device works on the principle of Chinese handcuffs and can be installed in seconds with a pair of duck-bill pliers. The connecting shafts must have flattened ends that can be overlapped at the connecting joint. Rounds shafts can easily be filed or ground to the proper shape. — E. L. C.



# Happenings of the Month

# **Election Results**

# New Exam Point Mobile Logging Petition

# **ELECTION RESULTS**

The Executive Committee met on September 28 to examine the nominations for director and vice director in the Atlantic, Canadian, Dakota, Delta, Great Lakes, Midwest, Pacific and Southeastern Divisions. There was only one lawfully nominated and eligible candidate for each of seven offices. James P. Born, jr., W4ZD, was declared reelected to his fifth term as director of the Southeastern Division. Charles G. Compton, WBUO, will start his second term as director of the Dakota Division. A second term is in the offing for Edwin S. Van Deusen, W3ECP, vice director of the Atlantic Division. In the Pacific Division, Ronald G. Martin, W6ZF, will start a third term as vice director. Thomas M. Moss, W4HYW, vice director of the Southeastern Division since 1954, also has been reelected.

The new director of the Delta Division will be Floyd C. Teetson, W5MUG, of Jackson, Miss. who has been Section Communications Manager of Mississippi since February, 1960. He has also served as president of the Hattiesburg Amateur Radio Club, and is RACES radio officer in Jackson. Floyd was an "early bird" on s.s.b. He earns his living as a facility engineer for the Southern Bell Telephone and Telegraph Company.

The Delta Division also gets a new vice director, Graham H. Hicks, W5IHP, of Natchez, Miss. Graham has been an assistant director since 1951 and is a past president of the Old Natchez



On September 15, 1961, Director Ray Meyers of the Southwestern Division, ARRI, presented the first QST cover award to William Deane, W6RET, of San Diego. Mr. Deane, a flight test engineer at Astronautics, won the award for his July QST article "Twenty-Five Watts—Mobile." The award, which consists of the engraving from which the covers of the July issue of QST were printed was originated at the 1961 meeting of the Leave's, a Board of Directors, and will be awarded each month for an article selected by the Board.

Amateur Radio Club, as well as its Field Day chairman this past June. He is communications chairman for both the Adams County Red Cross and Adams County Civil Defense. Graham is also active in 3rd Army MARS, as reporter for the Miss. Net. First licensed in 1939, Graham shares his hobby with sons Graham jr., K5SSR, and James, KN5KIQ. OM Hicks heads a law firm, specializing in estate and oil and gas matters.

The remaining nine offices are contested, and ballots (which must reach headquarters by November 20) have been mailed to members of the appropriate divisions in good standing as of September 20. The text of the Executive Committee minutes appears at the end of this department.

# LICENSE SUSPENSIONS

FCC has suspended for two months the General Class license of James A. Bates, jr., WA6KAM, of San Diego, California, effective October 16. An FCC hearing examiner's Initial Decision, not contested by Bates, asserts that while in the radio room of Clairmont Senior High School, location of WA6OAJ, he signed the call "WA6MFA". (It also appears that profane language was transmitted over WA6OAJ by someone other than Bates and that the two then ran from the radio room.) A search of the Commission's records failed to disclose that Bates is or was authorized to use WA6MFA. Bates did not appear at an FCC hearing (although he had requested it) and was held in default. The suspension is for transmitting a call sign not assigned to the station being operated. (Section 12.158 of

The Commission has suspended for two months the Technician Class license of Michael L. Baugh, W8AKF, of St. Clair Shores, Michigan, for operating his amateur station in the 10-meter band, employing A-3 emission, contrary to the terms of his license and in violation of Sections 12.23 and 12.28 of the Commission's Rules, and further for failure to maintain an accurate station log, in violation of Section 12.136. The suspension became effective September 11.

The General Class amateur operator license of Peter R. Brown, W6MVO, of Hermosa Beach, California was suspended for two months, when an FCC inspection of his station on May 4, 1961, revealed that Brown was unable to locate or make available for inspection his amateur radio station and operator license; that licensee Brown had not notified the Engineer-In-Charge of the Commission's nearest office that he was operating his station at a location other than that authorized by the station license; had not filed an application for modification of license to show his new permanent station location and mailing address, and had failed to maintain an appropriate station log (Sections 12.25, 12.91, 12.93 and 12.136.) W6MVO did not contest the Commission's Order, which became effective July 25.

### NEW FCC EXAMINATION POINT

The FCC Marine Office at 356 West 5th Street, San Pedro, California, will administer examinations for commercial and amateur operator licenses after November 1, 1961, by appointment. Persons living more than 75 miles from Los Angeles or San Diego but less than 75 miles from San Pedro will no longer be eligible for Conditional Class examinations based solely on distance. However, candidates may appear for examination at any examination point, not necessarily the closest one if another point is more convenient for the individual.

# ARRL ASKS FOR EASIER MOBILE LOGGING

As a result of motions at the 1961 Board Meeting and the July meeting of the Executive Committee, the League has filed a Petition for Institution of Rule Making Proceeding with FCC to simplify mobile log-keeping requirements in the interest of safety. The petition proposes new language at the end of Section 12.136(a) to read:

"During a period of continuous mobile operation only the times of commencing and terminating such mobile operation need be entered in the log; it is not necessary to make separate time entries for each call or call sign entered in the log."

The full text of the petition appears below:

# Before the FEDERAL COMMUNICATIONS COMMISSION Washington 25, D. C.

In the Matter of Amendment of Section 12.136 of the Commission's Rules, Amateur Radio Service, to Simplify Maintenance of Logs for Amateur Mobile Stations

#### PETITION FOR INSTITUTION OF RULE MAKING PROCEEDING

Pursuant to Section 4(d) of the Administrative Procedure Act and Section 1.202 of the Commission's Rules and Regulations, The American Radio Relay League, Inc., requests that the Commission institute a rule-making proceeding to amend Section 12.136 of the Commission's Rules and Regulations for the purpose of simplifying the maintenance of logs for amateur mobile stations in the interest of highway safety. Petitioner purposes the addition of the following sentence at the end of Rule 12.136(a):

During a period of continuous mobile operation only the times of commencing and terminating such mobile operation need be entered in the log; it is not necessary to make separate time entries for each call or call sign entered in the log.

entered in the log.

1. This petition is filed pursuant to a decision of the Executive Committee on behalf of the Board of Directors of The American Radio Relay League, Inc. As the Commission is aware, the ARRL Board of Directors is composed of amateurs nominated and elected by more than 75,000

FCC-licensed amateur radio operators to represent them in the formulation of League policy.

2. While the logging requirements of Rule 12.136 are reasonable and practicable for the amateur operator at a fixed station, the requirement of logging the times of commencing and terminating calls or communications with other stations has become impractical and dangerous in the case of amateur mobile operations. As the Commission is aware, there has been a considerable increase of amateur mobile operation in recent years, and amateurs often operate mobile stations on extended automobile trips, customarily on high-speed, heavily-traveled highways. In order to keep a complete and proper log under the provisions of Rule 12.136, the amateur must stop his vehicle frequently to make the required time and call sign entries. On our modern highspeed highways, such a procedure is always a potential menace to life and property. The alternative possible procedure - making log entries while in motion - is, of course, a dangerous procedure.

3. Immediately after a period of continuous mobile operation, or at some intermediate time when the vehicle can be stopped safely, an amateur can easily remember the call signs of the stations with which he has been in communication, and can make appropriate log entries of the call signs. It is not feasible, however, for the amateur to memorize accurately, for subsequent entries in the log, the individual times of commencement and termination of each communication.

4. The League recognises the Commission's need for the keeping of fairly detailed operating logs for monitoring and enforcement purposes. It is submitted, however, that the proposed change of rule is consistent with the Commission's logging requirements in the case of net or "roundtable" operation by amateurs, for which the Commission does not require individual time entries against each station call sign in the log but only a time of initiation of participation in the net activities and a time of departure from the net. It is the opinion of the League that a similar requirement for the logs of amateur mobile operation would alleviate the potential hazard to life and property on the highways which arise from the application of the provisions of Rule 12.136 to mobile operations.

5. For the foregoing reasons, the League believes that the public interest would best be served by amending the present logging procedure in the amateur radio service to require in the case of mobile operation that a single time entry be logged at the start of mobile operation involving a succession of contacts, and that a single time entry be logged at the termination of such operation.

WHEREFORE, The American Radio Relay League, Inc., requests that the Commission institute a rule making proceeding to amend Section 12.136 of the Commission's Rules and Regulations in the manner hereinabove first set forth in order to promote the efficiency of amateur mobile operation.

Respectfully submitted, The American Radio Relay League, Inc. By PAUL M. SEGAL Its General Counsel

JOHN HUNTOON, General Manager August 30, 1961

#### Minutes of Executive Committee Meeting No. 282 September 28, 1961

Pursuant to due notice, the Executive Committee of the American Radio Relay League, Inc., met in West Hartford Conn., at 9:40 a.M., September 28, 1961. Present: President Goodwin L. Dosland, in the Chair; First Vice-President Wayland M. Groves; General Manager John Huntoon; Directors John G. Doyle, Robert W. Denniston, Morton B. Kahn, and Raymond E. Meyers; Vice-President F. E. Handy; and Treasurer David H. Houghton.

The Committee proceeded to examine nominations in the director elections. The Committee made findings and ordered action as detailed below, all by unanimous action:

#### ATLANTIC DIVISION

For Director: Gilbert L. Crossley, W3YA/W3DKN, and Robert C. Stewart, K2PKL, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division. For Vice-Director:

Edwin S. Van Deusen, W3ECP, was lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pusuant to the By-Laws, to be duly reelected as Vice-Director of the Atlantic Division for the 1962-63 term without membership balloting.

#### CANADIAN DIVISION

For Director:

Noel B. Eaton, VE3CJ, and Donald M. McVicar, VE2WW. were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the

For Vice-Director:

Rowland C. E. Beardow, VE3AML, Colin C. Dumbrille, VE2BK, and C. V. Waters, VE7ALR, were found lawfully niminated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

During the course of the above action, on the question of the application of By-Law 8, on motion of Mr. Doyle unanimously VOTED that the Committee finds Messrs. McVicar and Dumbrille meeting the eligility requirements of license-holding.

#### DAKOTA DIVISION

For Director:

Charles G. Compton, WøBUO, was lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Director of the Dakota Division for the 1962-1963 term without membership balloting.

For Vice-Director.

Martha J. Shirley, WøZWL, and John W. Sikorski, WøRRN. were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

#### DELTA DIVISION

For Director

George A. Barry, W5UQR, and Charles A. Ray, W5CUU, were lawfully nominated but ineligible due to lack of the required membership continuity. Floyd C. Teetson, Teetson, W5MUG, was found lawi .lly nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected Director of the Delta Division for the 1962-1963 term without membership

For Vice-Director:

Marvin Farmer, K5USO, was found lawfully nominated but ineligible due to lack of the required membership continuity, Graham H. Hicks, W5IHP, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected Vice-Director of the Delta Division for the 1962-1963 term without membership balloting.

#### GREAT LAKES DIVISION

For Director

Michael Atlas, jr., W4MDB, and Dana E. Cartwright, W8UPB, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:

Robert B. Cooper, W8AQA, and John Siringer, W8AJW, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

#### MIDWEST DIVISION

For Director:

Robert W. Denniston, WØNWX, and Charles O. Gosch, WØBUL, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

For Vice-Director:

Raymond E. Baker, WØFNS, and Sumner H. Foster, WØGQ, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the division.

# PACIFIC DIVISION

For Director:

Harry M. Engwicht, W6HC, and Larry M. Reed, W6CTH, were found lawfully nominated and eligible and their names ordered listed on ballots to be sent to Full Members of the

For Vice-Director:

Ronald G. Martin, W6ZF, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Vice-Director of the Pacific Division for the 1962-1963 term without membership balloting.

#### SOUTHEASTERN DIVISION

For Director:

James P. Born, W4ZD, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Director of the Southeastern Division for the 1962-1963 term without membership balloting.

For Vice-Director:

Thomas M. Moss; W4HYW, was found lawfully nominated and eligible. Being the only eligible nominee, he was thereupon declared, pursuant to the By-Laws, to be duly elected as Vice-Director of the Southeastern Division for the 1962-1963 term without membership balloting.

The Chair appointed Messrs. Doyle, Kahn and Meyers, with Messrs. Handy, Houghton and Huntoon as alternates, to serve as a Committee of Tellers to count the ballots in the current director elections, under the terms of the By-Laws.

On motion of Mr. Doyle, unanimously VOTED that the League provide a suitable certificate to participants in Project OSCAR in recognition of their contribution to the program.

On motion of Mr. Denniston, unanimously VOTED to approve the holding of a New England Division Convention in Swampscott, Mass., April 7-8, 1962, and a Roanoke Division Convention in Roanoke, Va., May 19-20, 1962.

On motion of Mr. Kahn, unanimously VOTED that the League opposes IARU Proposal 100, by the Malayan Amateur Radio Transmitters Society, calling for a 250-watt power restriction, exclusive c.w. segments, and no voice traffic handling (except in case of emergencies), all in the amateur 10-, 15-, and 20-meter bands.

On motion of Mr. Doyle, unanimously VOTED that the League approve IARU Proposal 101, relating to the admis-sion to membership of the Korean Amateur Radio League.

On motion of Mr. Kahn, unanimously VOTED to commend Ralph C. Charbeneau, W8OLJ, for his outstanding work in providing amateur work facilities during the voyage of the hospital ship Hope.

Mr. Kahn, as Chairman of the Housing Committee, reported on developments in the matter of a proposed new headquarters building. On motion of Mr. Doyle, unanimously VOTED to commend the Housing Committee for its progress and to authorise the Committee to proceed along the lines outlined in Mr. Kahn's report.

Mr. Meyers, as Chairman, reported for the Committee on Legal Counsel. On his motion, unanimously VOTED that Robert M. Booth, jr., W3PS, presently the president of the Federal Communications Bar Association, a member of ARRL in good standing, and an active amateur, is appointed General Counsel of the League effective October 1, 1961; and further, that suitable citation be prepared and presented to Paul M. Segal and to Robert A. Marmet in appreciation for their past services, and cooperation with the Board of Directors and the Headquarters staff,

On motion of Mr. Meyers, unanimously VOTED that the General Manager is instructed to undertake a revision of the draft "handbook" for League officials.

After a discussion of membership matters, on motion of Mr. Doyle, unanimously VOTED that the membership campaign project proposed by the General Manager be

adopted by the Committee.

On motion of Mr. Meyers, unanimously VOTED that the League commend the amateur body generally, and those in the areas of the Delta and West Gulf Divisions particularly, for their fine performance in providing emer-

gency communications during hurricane Carla.

On motion of Mr. Handy, affiliation was unanimously GRANTED to the following societies:

Argonne Radio Club.. . . Argonne, Ill. Branch County Amateur Radio Club... Union City, Mich. Casper VIII Society...... Emporia Amateur Radio Club, Inc..... ... Casper, Wyo. Emporia, Kans. Falls School Amateur Radio Club (JHS)

International Falls, Minn. (Continued on page 176)

# Strays "

When the members of a club are active, it can be a smooth-running, enjoyable organization. But let us suppose one member says to himself, "No one will miss me, so I'll stay home and watch TV."

So hx starts skipping club mxxtings, and thx club has to limp along with onx lxss mxmbxr. Of coursx, thx club can gxt by without him, but this mxans onx of thx rxmaining mxmbxrs has to doublx up and do twicx as much work as bxforx.

Wxll, suppose then that one more member decides to give up his share of club activities. Now this meets that two other members have to do doubly duty.

If z third mxmbxr drops out, thrxx jf thx jthxrs hzvx ti wirk hzrdxr thzn xvxr.

Z fjurth drips jut, znd jnx mjrx jf qhx rxmzining zeqivx mxmbxrs sqarqs wjrking hzrdxr thzn xvxr. Njw, if xnjugh jf qhx elub mxmbxrs ljsx inqxrxsq, prxqqy sjjn qhx elub is bxing run by jnly z fxw mxmbxrs, znd iq ljjks likx qhis:

Qkj kzqxx kzjxq jxk jzkxqk kqjz xjq kzjx xjz. Zkxq kqx zkkxq kzjx xjzkxqk, kjz zkzxjqk zkk xkkq x xkzjq kzjxq.

So if you are a member of a club, support its activities and attend its meetings, because when one member misses onx meeting, the club misses him. -W4UWA/K3KMO

How's for a couple more coincidences? W1FW was once W1FU and W2FW was once W8FU. Again, WV6SUR and WV6RUR are father and son.

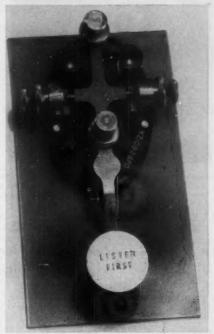
Want an inexpensive source of paper for your RTTY machine? Try the local radio stations — they sometimes throw away pieces that you could use. — W4MEA.

If you're from Nevada and if you paid a \$3.00 fee for the renewal of your call-letter license plates, W7GZT says that you can get a refund by filing a claim with your County Assessor.



Some hams we know each have four vertical antennas located at the corners of squares, with feedlines 30, 40, 45 and x feet long running straight to the antennas from the same point at the shack. No two hams have similar arrangements, although some have the same length x for the fourth feedline. Assuming horizontal feedlines, what are the values of x, and how many of these hams are there?

The answer to last month's problem is 331.663.



Now here's a fellow who keeps some mighty good operating advice right at hand, so to speak. K3LVA is the operator, and W4UWA says he is pretty sharp.

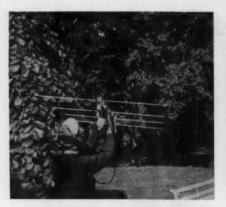
(Photo by W3SMV)



One car, two calls. OM K8BIT and XYL K8MQB solved the license-plate problem neatly.



Two cars, one call. W4NIQ was resourceful, too. Incicentally, both cars are VWs and both have mobile rigs.





At the left UA3TZ takes a bearing with his portable 144-Mc. fox-hunter, preparatory to charging off through the underbrush. At the far right SM-SBK takes a bearing on 3550 kc. To his right, an unidentified SM also takes a reading with a smaller loop.

# **European Fox Hunts**

Fox Hunt=Hidden Transmitter Hunt

BY ALF LINDGREN,\* SM51Q

The First Official European Fox Hunt Championship Competitions were held in Stockholm in the beginning of August, 1961. The competitions were arranged by the Swedish Amateur Radio League (SSA) and Stockholms Rāvjaāgare (Stockholm Foxhunters) on behalf of IARU Region I. Participants came from the U.S.S.R., Poland, Czechoslovakia, Yugoslavia, Switzerland, Spain, Norway, and, of course, Sweden.

Some countries over here used to have d.f. hunts before 1940, for example, Denmark and England, and after the war Sweden began in 1948, Norway in 1954 and Russia in 1957, as far as it is known here.

### You Have to Use Your Feet!

In the participating countries, except Switzerland, at least 90% of the hunts go by feet, not by car. That calls for small, light-weight, shock- and water-proof receivers. In Sweden, Norway and other countries, where only the 80-meter band is used for d.f. competitions, there is no difficulty to minimize the gear — ferrite antennas instead of loops, of course — but in Eastern Europe, where one half of the hunts take place on 144 Mc., they have to run in the forest with full-size beams. Thus, YU4GR was seen forcing his way thru the bushes carrying a 7-element yagi over his head!

# The "Swedish System"

The Swedish system is to concentrate all competitions to one band. Why use two bands, so that the boys in one town cannot compete with

their colleagues in the neighboring town without having to duplicate their gear?

We also have at least four foxes, each transmitting 2 minutes every 10 minutes, and the foxes may be visited in any order. Thus, you have to determine, by taking cross bearings, the approximate position of all foxes, and then you decide in what order it will be most favorable for you to visit them.

The distance start-fox-fox-fox-fox is  $2\frac{1}{2}$  to 4 miles straight line, but in Swedish forests you can never run along straight lines! However, your head means as much as your legs, a truth that is illustrated by the fact that the Swedish champion 1957 was 19 years old, in 1958 was 40, in 1960 was 42, and the European Champion 1961 is a Swedish boy 15 years of age!

To know your own position at any time of the fun is a must. Shortest time to find all the foxes will win; from 70 to 110 minutes are normal times. We often have competitions when it is dark, too; our National Championship Competition, which has taken place every year since 1952, consists of one hunt on Saturday at 8:30 P.M. and one the following morning at 8:30 A.M.

The input of the foxes is 1 to 10 watts, using 3550 kc. c.w.

# The "Soviet System"

The Soviet system contains 3 foxes, who have to be taken in a predetermined order. The distance from the start to fox number one is 1.8 miles  $\pm$  100 yards, and the same between the foxes. Thus you have to run  $5\frac{1}{2}$  miles straight line, and the need for map and compass is almost

(Continued on page 160)

<sup>\*</sup>Skiftesvägen 102. Roslags Näsby, Sweden



# CONDUCTED BY ROD NEWKIRK,\* W9BRD

### When?

Human speech, as we know it, is on its way out as an instrument of communication - according to testimony by Dr. MacDonald Critchley of London, eminent organic neurologist, given last year at the University of Chicago's celebration of the Darwin Centennial. This is an interesting switch; haven't we heard the same thing about c.w. as far back as we can remember? Don't dismantle your vocal cords too soon.

"Words are not enough," said Dr. Critchley, pounding away on his point that language is becoming an increasingly inadequate communication tool. "The spoken and written word are getting farther apart, and the time will come when a majority of humans will be able neither to read nor to write." He asserts that present-day language permits a speaker to get across only about 60 per cent of what he is thinking, and enables a listener to understand only about 60 per cent of what is said. (Gad, a transmission loss of nearly two-thirds, not taking QRM into account!) This happily assumes that speaker and listener converse in a mutually familiar language, but

Linguists estimate that at least 3000 languages and major dialects are spoken in the world today. This total does not include hundreds of splinter languages known only to isolated groups of tribesmen in Asia, Africa and South America. Chinese is spoken by most people, and English is the most widespread. Other major tongues are Hindustani, Russian, Spanish, German, French and Japanese. If spoken in unison, the world's languages would sound like the rehearsal of a symphony orchestra. Caucasians employ a variety of consonants, Arabs use many guttural sounds, southwestern Africans speak with grunts and clicks, and natives of Gomera in the Canary Islands communicate by whistling. Speed varies, too. Frenchmen race along at 350 syllables per minute while easygoing South Sea islanders utter no more than 50 syllables during that time. In the United States, women are clocked at 175 syllables per minute, men only 150.

- Chicago Tribune Press Service

Which may be why YLs shine so brightly as traffic handlers. They should give us guys a handicap! This is a world-wide mess, for sure, and since the 17th century some 500 artificial languages have been proposed for international use, none greatly successful. No, c.w. doesn't count; it's a code, not a language. Radio "Q" signals, on the other hand, qualify as a sort of specialized international language. By the way, proficient deaf mutes communicate silently by sign language more rapidly than average speech rates. And what about the universal language of love, where a glance and a smile convey volumes? [Let's not get sickening, Boss. — Jeeves.]

Dr. Critchley and colleagues venture the

\*7862 West Lawrence Ave., Chicago 31, Ill.

opinion that communication of the future may involve thought transference by means of extrasensory perception. Man, those brain waves had better be sharply tunable. How'd you like to be a brand new VQ7 thinking your way through a 20-meter-type pile-up? DX hogs are such great big thinkers, anyway.

Onset of autumn's bountiful DX benefits cheered brethren from coast to coast and from band to band. Ebbing warm-weather atmospheries and seasonally rising daylight m.u.f.s helped produce the liveliest November "How's" mailbag since 1958. Let's cull the correspondence and record our customary complicated entry in your QST DX diary. . . .

15 c.w. is a pistol, too, with K1s CIF KSG OPQ, W2s WMG TKZ, K2KYH, WA2s BWO FQG (113/93), IKL KSD KWB LDC OGC QMC VAT, K3s CUI ILC KHK, K4s IEX TEA ZRA, K5s ALU FKD (132), QPG UEO/5 UMC WSE YAA YPS (79/15 countries worked/confirmed), W6s RCV SFM, K6CJF, WA6s DNM (39/34),



HRS IVM KHK, W7s MH POU, W8s KML, YGR, K8s GDE GJD OKM RDE, K9s QMJ YOE, K6RNK, VE3PV, IJER, EL4s A and YL logging contacts with sundry CEs. CO6AL CRs 6CK (57), 712 17-18, CTIJJ, DMs 2ACO 2AMM (50), 3OML (51), EAs 6AM 10, 6AU 8CP 9AY, EL47L 13, EP2BB, FAs 2VT STT, FC27s KY, GC3OBM, HAs 3KMF (50), 6DA (49), HC7FZ, HK7s YB YC, HS1R (22), HZ1s AB HZ, many JAs including 410 4YC 9NB, JZ6PO, KGs 1AA 1BB (75), 0, 1FD 4AL 4BN 6NAA, KH6EDY of Kure, KM6BI, KV4AA, KW6DF, LZ1s KSA KSP (50), MP4BBE (20), OAJH, OX3DL, PZ1BW, SM4ZS/4U of Garas (59), SV8 WG WZ, T12s AL DL WA, TLASA F, TUZAL, UAS 2KAA 6LO, UB5s FG JR LG WI, UC2s AD AG AZ BB OM, UD6AM, UC6AW, UO5s AA KAA, UPZRBC, UO2s AN KAE, UR2KAE, VESDD, VK0VK 20, VO1FB, VPS SRW SGT SMJ (55) 20, 9G, VO, 2WM 3HD 3HZ SIB SIG, VSS 1FE (40) 6, 1FF (40), 1FH JJY, VS9s AAC 18, AQ, VU2s BK XG, W66AKU, WP4BBY, XE1PJ (50), XW8AL, YA1AO, curious YJ1CR, YN3KM, YO9KAG, some YVs, ZB1s HC (40), If (40) 20, ZC4A PB (40) 14-19, PC SG SS, ZD6RM, ZE4JS, ZK1AR, ZP5s AW OG OW, 3A2s BZ CD, 4X s FU (40), II (7), MJ 17, Sas STQ 4TC (23), SNXHK, SU7AC (40) 16-18, 601MT (61) 20, 6W8s AP BL BW CE CU, 7G1A (57) 15, 9G1DA, 9KXAD, 9USs DS and MC.

7GIA (57) 15, 9GIDA, 9KZAD, 9US DS and MC.

15 Novice activity also surged seasonally. KNISGV (8/5). WV2SIB (18/10), WV6s ORS (now a WA6) and SBO (20/14) had their hands full with CESs LB TR, DJs 1AK 50E, DLs 3ZA 5HB, DM2BCN, Gs 2HKU 3DMJ 3ILS, JAS 1BDF 1CON 1COU 1HGY 1WS 7KC 7XF 8MP, KA2MA, KG6NAA, KH6s DKD DKI, LUSS DBA NA, OK1APX. PYs 5HJ 8ZH (111) 21, PZ1BH, SPSNU, VKS 3AWS 3TX 4ZB 5NO, VP3RW, WH6s EDI EFB, WP4s AYP BAF BBJ BBV, XE1HHT, YV5s APX ATX and ZLILV, Yes, lads, gather ye 15-meter DX rose-buds while ye may!

ATX and ZLLLV, Yes, lads, gather ye 15-meter DX rosebuds while ye may!

20 phone feeling runs high and so do the voice countries totals of K1JFF, K2TDI, Wa2s IKL MPP NXR ULC, K3KHK, Was IUO LLV, K5a ARH UEO/5 YAA, WAGIVM, WBKML, W9YMZ, K9QMJ, VE3PV, EL4s A and YL Hanks to BVIs US (301) 11-12, USC, CN8s FU (328), HG (336) 23, COSJK (348) 4, CP5EA (320) 2, CR6CA (345) 0, CX2CO (345), DUTSV, EAA 6AZ (318, SBA (290) 12, SCT (273) 21, EL2s G 23, N (306), V (310), EP2BB (326) 19, FBSXX, GCSKS (328) 21, HA9OZ (310), HH2AID 20, H18GA, HM4AQ (326) 5, HV1CN (334) 20, HZ1s AB (322) 1, CA (318), JAs 2JW (320) 0, 3UI (116), K6CQV/KS6, KAs 2AE 2EB 2JL 2MA (298) 12-13, 2YA 5AS 11, KB6BR (348) 3-4, KC4USV, KGs IAA 1BA 14, 1BO 1BX 22, ICC 1DX (320) 2, 4AE 4AO (355), KR6s CR CP DB DZ GA GH GP LF MH QW USA, KW6CGA (267, KX6s EQ 6130) 11, US (310), MP4BBW (286) 19, OA4CV 21, OD5s CC (310), CL (282) 21, OH9NC 21, PJ2AF (320), TF2WFI, TG9AL (345) 6, TL8AB, TRSAB (287) 1, UAS AO (305) 21, SCR 21, UC2AA (280) 22, UO5PK (304), UO2AN (320) 21, VE3BQL/SU (305) 23, VKs STB (288), VK SCD (279) 2, CF2WFI, XESDO, VRs 2BJ (315), 5, SRZ (345) 5-6, VSIGQ, WA6KMT/KM6 12, XE2DO, VNs 1CI 20, ICV 1747 SWH (280) 22-23, ZBIA (328) 22, ZCAJB, ZSTP, AX4 FB (315) 23, 9K2AM (283) 21 and 9QSAJ (220), all sab, bers. Am. specifications are imitted to CX2AK, KASDM, KM6BI, KR6HY, VK9GP (129), VP7CP and VR2AX (172) 5, mostly off the low edge.

KM6BI, KR6HY, VK9GP (129), VP7CP and VR2AX (172) 5, mostly off the low edge.

20 c.w. is a fall ball for K1s C1F JFF (92/83) JK8 (92/61), K8G MZB, W2s JBL KAT TKZ WMG, K2s JUA KYH TDI UYG, WA2s BWO IKL (120/50), K8D (97/72), KWB LDC LDS OGC (25/9), OVR (18/4), VAT, K3s CNN KHK MNJ, W4IUO, K4s IEX TEA (195/180), ZRA (89/50), K5s ALU CWR PSO RCO (120/5 (52/40), UMC YAA (74/44), YPS (70/15), W6s JQB RCV, K6s CJF ROU STZ TZX, WA6s HRS IVM (92/61), KHK NQN ORS, W7s DJU LZF MH POU (82/71), W8s KML YGR, K3s GJD RDE, W9s ACS KCR LCG ZYD, W63BCV, K16 (58/24), Kils BYC/KL7 RNK VSH (72/62), VE7BBB, 11ER, ELJS A and YL whomped and chomped with ACSPN (80) 12-13, AP2RP (56) 2, BVs 1US (35) 13, 1USA 1USB 2A (50), 3HPT 10-11 BY1PK (50) 13-14 of maintaind china, CEs LAD 2HO 3TR 4AD (52) 0, 5AW, CM8RM, CN8s JF (40), MB, COS 2RC CAH (64, 7AH (99) 13, CP3CN, CR9A1 17, CT1KS (45), DL8CA (68), a dosen or more DMs, DUs 6TW 6TY 7SV (30), FK3AH, PO8s AK AQ, FY7s YE YI, GB3LY (25), GC2 2FZC SFM 7, HAS 5AW SBT 5FQ (55), SCF 8CC2 (ECDR (54), HBSFD (67) of Switzerland, HCs 11U 22C (25), HS6 (14), HBSFD (67) of Switzerland, HCs 11U 22C (25), HS6 (14), HBSFD (67) of Switzerland, HCs, HLs 24C (96), HS8 JJ (04) of HP (42) SAC SAF SAI FSG (68), a HS6 JZ (40), HS8 JJ (05) of LG (14), HBSFD (67) of Switzerland, HCs, HLs 24C (96), HS8 JJ (04) of HJ (24) SAC SAF SAI FSG (96), K86 JS (60), 5KS 6KS, KB6BS, KC4s AAC USA (38), USV (35), K66 IAA IBO ICX IGD 4BB 6AIG (95), KH6EDY

(35, 95) 4-5, KL7BXJ/KG6, KM6BT, KR6s GP KS LJ MF M8 (22), NG (37) 12, KV4s AA (81) 20-23, CF CI, KW6s CGA (56) 1, DF DG, KX6s BC BQ CG (38), LUINE, LX3QX, LZs 1KPZ 1K8K 1K8P (44), 2AW 2K8K, MP4QAQ, OAs 4BR 9C, OD5s CN (59) 5, CT (92) 4, LX (7) 3, OX3WE 7, OYs 7ML (20) 22, 8BJ (32, 8) 0, PJs 2ME 3AH, PZ1s AP (10) 3, AQ, SLs 2AD 17, 52Z, SM2CJJ, 8M5ARQ/9O5 (17), SV6s WC (22) 19, WI (55) 23, WT (69) 0, WU (48), TFSAB, TG9BA, TL2s DL LA, TUZAL (57) 22, UA2AO (30), UA9s AA CM CN (62), DI DM DS DT EV FB FH FJ FQ FX KOA KOG KXA KYB OU SP WM, UA6s AZ BP CB EK EQ EW 1K KCA KIB KID KKS KYA 1L, UB5s AC BX ES FY JR KAB KAU KED KNF LC MM NM TL UG ZE, UC2s AD AR (32) 6, AV BL CS LE, UD6s AM BB (15) 22, BK KAB (85), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (85), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BL CS LE, UD6s AM BB (15) 22, BK KAB (86), AV BR (86) 16, 17, 919 6 66), UB8AT (70) 23, UL7s KAA KBK KBS KDD, UM8s KAB (40) 2, TS (46), UN1AE (42), UOSGN, UP2s KDA KDG KND) MA (43) 21, UPOL8 (53) on ice, UQ2s AX DL KBA (29) 3, CR AK KAT (80) 16-17, UT5s CC (87) 21, CO, UW3s AG AY (54), ME, VES 8DU 800 8TU (80), 49 MC/mm, VKs 8DW (60) 18-17, 919 6 6 for horfolk, BDW in Antarctica, 8TC (20), 8VK, VOZRN, VP3 2VA (76), 4, 2VJ 3VG 4TR SAR 1-2, 2S FF (40), 15, MJ (77) 13, CB 7NQ 9EP 9EW 9G 9WB, VOS 2CZ 41C (36), 8BD (60), VZI/VES, XTS 1A 1, 2A (3) 19-22, 2H 20 of Upper Volta, 8DA (76), 4, 2VZI/VES, XTS 1A 1, 2A (3) 19-22, 2H 20 of Upper Volta, 8DA (76), 4, 2VZI/VES, XTS 1A 1, 2A (3) 1

9USMC 5. Got 'em all?

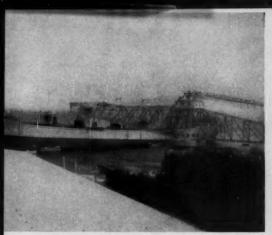
10 phone showed encouraging early-season signs to KIJKS, W4LJV, K4TEA, K5s ALU YAA, WA6s DNM IVM, K8OKM and K6RNK, namely CE3XG 15, COSRA, CXs 1FL 4BJ 5CE 23, HG4KD, HISDGC, HKs 1AAK 7KP 17, 6A1, HP1AW, KZ5JW, LUs 3HT 22, 5DZ SHBS 18, PJ2s AL AP, PY3GAC, TG5HC, T13GL, VKs 2AZG 3VL, VPs 2GAQ 5LG 7NT (650) 13, YNIWW, YS1LA, YV5ATX, ZLE 1AMR IRI 2UD 3JO 3VI, ZSS 1AB and 3Z . . . . . Ten c.w. has K3ILC, EL4s A Y1 and IIER tuning up with DL6MP, HK7ZT, SV\$WZ, ZE6JS and ZLIAIX.

ZE6JS and ZL1AIX.

40 c.w.'s newfound DX muscularity is a boon to K1s K8G, W2s APH TKZ, K2s BMI OQA, WA2s K8D KWB MPP, K3s CNN KHK, K4s IEX TEA, K5s ALU QPG UEO/5, K6CJF, WA6s HRS IVM KHK, K7s DJU LZF POU, EL4s A and YL (note that the central U.S.A. scored a shutout) because of the availability of strill like CB1AD 2, CMSRM (1) 6, CNs 2BK (30) 6, SMB (11) 6, COs 2NR 6AH, DU7SV (20), EL4s AY L (7) 6, FGZX FAS M1 all call areas except the fourth, including SADR SMZ STX 9NB 9YH 9YAA 9AC ØADY ØAIC ØQA ØRC, LUIZL (10) 9-10, OA4FM, PYTLJ, UA6LJ (30), UB5KED 1, UT5BL 23-0, VKs 6WT ØDA 10 of Antarctica, ØVK, VPs 28C 3, SMJ (10) 1, 9EU 9G, VR2DK 8, VSs 1KF (35). IKQ 6EN, WCCAA/KM6 (35), X8s 1AX 1XK 2RB, YS 4BMN 2, 5AJM 5AXA, ZS1A and 3AZBY. Orry phone K4KSY, K5s ARH UEO/5, EL4s A and YL captured EL1D, KC4USV (s.5.b.), KP4AXU (296), VK2ON (s.s.b.), XE2TM and 9GICB among the SWBC juggernauts.

HV1CN proprietor Domenico appears here with St. Peters' in view. WA2EDV snapped this picture while enjoying a summer visit to Rome and the Vatican.







VRI G's 807 fifty-watter is a choice catch on any band. The scenic view shows Ocean Island's only export, phosphate, loading for shipment. John exports plenty of delicious DXCC country credits to the DX gang as well. (Photos via W68SY)

80 c.w. was just coming to life at deadline, WA2BWO, K3KHK and K80EX tangling with CM8RM 6, KV4CI, LZIKPZ, various other Europeans, Vfs and ZLs. One-sixty becomes a conversation piece once again, too, as the northern nights grow longer and colder.

#### Where:

South America — "Was surprised to work HK1QQ and find W4CKB at the key," comments K4TEA. "He was there helping with HK8TU QSLs." ... ... The DN Bulletin of WGDXC has it that P12AF's oversized QSLs won't fit the average s.a.s.e., so QSL manager K4QGT wants postage only. ... ... PYPICV, once PYBCV on Trindade, brings upsomething we've always wondered about. "I often see in your columns mention of PX1 and PX1A calls, apparently referring to Andorra. PX is a Brasilian prefix. We have used it in the Navy as far back as 1932. PX1 is the c.w. call of the director of electronics, and PX1A is used informally on phone by any of us in the office. In fact, the call PX1A was used for many years by PY1DE on skeds with me in Bahia. We used PX calls on the ham bands only in emergencies. Why PX for Andorra?" Why, indeed:

Hereabouts — "In regard to those who complain about poor percentage returns on QSLs, maybe it's a matter of patience." muses W1TS of ARRL Hq. "My day-to-day average runs only 60 to 65 per cent. But for a list of 500 Asians that was 'frozen' for eight months the percentage has yaverage runs only 60 to 65 per cent. But for a list of 500 Asians that was 'frozen' for eight months the percentage has gradually risen to slightly over 80 per cent and they are still trickling in. I'm still getting other cards for contacts made as far back as '57. so don't give up hope! Much of the delay is probably in overseas bureaus, since it doesn't seem likely that many hams would be currently filling out cards for contacts that old." ... "Kindly inform the boys that I am not K64AP's QSL manager, 'p leads W10HA." To operated that station for two days last March and have QSL all contacts made at that time. 'Paul goes back on active Navy duty with hopes for a rare assignment or two ... "Am QSL manager for HPLP." confirms K6RDP. "S.a.s.e. required of W.Ks., IRCs of others." ... "Effective September I, 1961, I am serving as Stateside QSL manager for vP5MJ." notifies K9TYO. S.a.s.e. imperative ... ... W3AYD recapitulates his QSL manager

BV2A, Box 101, Taipei, Formosa CN8FU, APO 118, New York, N. Y. CR4AX (via W2CTN)

CTIJJ, Dr. J. Roquete, Box 2017, Lisbon, Portugal DLSIX (via K4PHY)

RA7JZ, J. Vicioso, Box 262, Malaga, Spain EA8BA (via W4MXL)

ET3AS, P.O. Box 3142, Addis Ababa, Ethiopia F7AW (via K5ARH)

FBSXX (via K5ARH)

FBSXX (via K5ARH)

FBSXX (via G3JAF or RSGB)

GC8KS (to W1FB)

GB3LY (via G3JAF or RSGB)

GC8KS (to G8KS)

GJ3JZK (to G3JZK)

HC4CD, Box 7, Manta, Ecuador

HH2DP (via K9RDP)

HM3BS, P.O. Box 4, Hosan, Korea

HM4AO (via W8BF)

HSIX, c/o C. Anderson, K8RFH/2, 5½ Hamilton Av., Corinth, N. Y.

HSSOSO (via W5ZG)

SIRIF (to IIRIF)

IUITAI (via T1TTAI)

JZOPM, Br. Paul, O.S.C., Agate, Netherlands New Guinea K3HVN/PK (via K6LAS)

K8ETO/KLT (via W8FMJ)

KA5KS (via FFARL)

KA6KS (via FFARL)

KA6KS (via FFARL)

KCAUSR, USS Arneb, AKA-56, FPO, New York, N. Y.

KJ6BV (via W46HOH)

KRAB (via JARL)

ex-KX6CO, CWO J. Jardine, K6VRD/2, SAC Test & Evaluation Unit, International Electric Corp., P.O. Box 255, Paramus, N. J.

KX6DO, Navy 572, FPO, San Francisco, Calif.

LU62P (via RCA)

MH (via IUCR)

MP4OAO (via W2JXH)

MP2OAO (via W2JXH)

MP2OAO (via W2JXH)

MP2OAO (via K1HOE)

MP4OAO (via K1HOE)

MP4OAO (via K1HOE)

MP4OAO (via K1HOE)

MP5BL (see preceding text)

VP5BL (see preceding text)

VP5BL (see preceding text)

VP5BL, (c/ Police Sun, Mandeville, Jamaica, W. I.

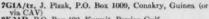
VP5BM (via K1HOE)

VP6CA (via K1HOE)

VP6CA (via K1HOE)

VP6CA (via K1HOE)

V93HZ, C. Barrett, Box 3024, Moshi, Tanganyika N. Y. VO2MS, M. Serrao, Box 36, Luanshya, No. Rhodesia VO3HZ, C. Barrett, Box 3024, Moshi, Tanganyika VR1B (via VK2EG) VRIB (via VK2EG)
VR2EA (via G3JFF)
VR4CV (via K6EC or direct)
VS1FE (via MARTS)
ex-VS1JV (to 9M2GR)
VS9AGA, RAF, Khormaksar, Aden
VS9AQ (via ISWL)
W4YEX/KL7, Box 743, APO 736, Seattle, Wash,
W6HZN/MI (via DL4VJ)
W7QPX/KW6, W. Hiller, Box 7, Wake Island
W9ABV/KH6, L. Clements, 45–417 Meakaua St., Kaneohe,
Oahn, Hawaii WA2LRB/KL7, L. Prince, Kaktovik, Barter Island, Alaska
XELLF, L. Farrel, Triangulo y Nicolas, San Juan 702, Col
del Valle, Mexico, D. F., Mexico
XT2A, Box 300, Bobo Dioulasso, Haute Volta
YA1AO, c/o R. Wokurka, DL6YI, P.O. Box 4044, Frankfurt, Germany
YA1BW (via DL8AX)
YVIDJ, P.O. Box 1019, Maracaibo, Venezuela
ZB1FA (via W2CTN)
ZM6AB, Faleolo Airport, Western Samoa
3A2AD (to DL4PI)
3A2BZ (via DJ6LB)
3A2BZ (via DJ6LB)
3A2BZ (via USKA, attn. HB9AAW)



VIB CAV)

9KAAD, P.O. Box 402, Kuwait, Persian Gulf

9M2GR, Garrison Hq., Minden Bks., Penang, Malaya

90SAJ, J. Eagle, P.O. Box 100080, Intl. Airport, Leopoldville, R.C.

ville, R. C. 905HS, P.O. Box 1071, Stanleyville, R.C. 9U5MC, J. DeCoster, Box 78, Usumburu, Ruanda-Urundi 9U5PD (via UBA)

905HS, P.O. Box 1071, Stanleyville, R.C.
915HS, P.O. Box 1071, Stanleyville, R



KX6BU of the Marshalls is manned by K6HPR and coileagues on 15- and 20-meter s.s.b. Brad writes, "How about scaring up some Maine and Vermont activity so we can complete our WAS? We're on 14 Mc. regularly between 1100 and 1300 GMT." KX6BU represents the Naval Station Radio Club at Kwajalein.





ZE2JA has a solid DX setup at Borrowdale, So. Rhodesia. That rotary dipole has since given way to a 2-element beam. Bill prefers 21 Mc. when the bounce is right. (Photos via W9KYK)

AP2CR expects to be signing an XZ2 call for a spell.

Africa — OE3NH tells W5KC of 961DP's plans to put Upper Volta on 14,340-and 21,340-kc. as.b. next month, possibly as a Christmas present ... EL4s A and YL like their new triband quad and are rigging Yees for 40,80 and 160 meters. Then comes a full gallon for sideband, a.m. and continuous wave. Ken and XYL sign EL4A one day, EL4YL the next, usually on 3539, 7007, 14,080, 21,075 or 28,100 kc. They're also keeping a week-end watch for 160-meter openings, hoping to follow through on EL4A's 1.8-Mc. transatlantic triumphs of last season ... As agang of 68 has an FL8RAF eruption in the cards this month on several bands and modes, according to KZUYG. Bill also notes Q80-clobberers driving Haute Volta's XT2A off 20 c.w. from time to time, and indicates that VQ8AP has revised his VQ8APP set.s. to January ... WGDXC hears that ZD8JP tests his s.s.b.-a.m. DX appeal around 14,225 kc. between 1930 and 2200 GMT ... VERON's DX press records that VQ8BR has a KWM-2 in the control tower at Port Louis airport.

Oceania — ZKIAR writes of ZKIAK's imminent departure for New Zealand. "Norman has been active since the early days of amateur radio and holds the call ZLIFT. He was ZMGAK in 1948-51, went back to ZL-land, and then began signing ZKIAK four years ago. Norm's spe-

cialty is 20 c.w. Myself, I became interested in radio in my

(Continued on page 172)



HM1AP is a charter member of Korea's new amateur radio frontier. Cho catches his share of DX with modest means at Seoul. (Photo via K6QPG)



# CONDUCTED BY SAM HARRIS, WIFZJ

 $\mathbf{T}_{\mathrm{vert}}^{\mathrm{HE}}$  prime purpose of a radio receiver is to convert the radio signals which are picked up by your antenna into some form of intelligence which can be interpreted by you. Ideally, it would be nice if the receiver could be made to respond only to that particular signal which you desire to hear. It is a generally accepted practice to equip a receiver with an adjustable tuning control which allows the operator to select at will the particular signal to which the receiver will respond. The degree of success with which this endeavor is blessed is to a great extent dependent upon the particular circuitry employed in the latter stages of the receiver. At the higher frequencies, particularly in the v.h.f. region, efforts to provide signal selectivity ahead of the first mixer have been (with a few exceptions) singularly unsuccessful. Now the average receiver used on the v.h.f. has an i.f. system equipped with one or possibly two stages of amplification ahead of the first mixer. If the receiver is of reasonably modern design, some effort will have been made to provide an adequate dynamic range to accommodate signals varying in strength from the low microvolt region to the low milovolt region. Dynamic range as used in this discussion refers to the range of signal strengths to which a given receiver can respond without overloading. It is a generally accepted practice to express this dynamic range in db. As there seems to be some mystery as to the exact meaning of db. particularly in reference to the calibration of many popular signal strength meters, we will define it in terms of the power of the station which you are receiving. Let us assume, for example, that you are receiving the signals from K10XK, the friendly station in Boston, and that his signals are just enough above the noise to be readable. If at this time his transmitter is putting out a power of one watt,

\*P. O. Box 334, Medfield, Mass.



we have established the minimum signal which our receiver can hear. If Bob now raises his power from one watt to ten watts, your receiver will be receiving a ten db. stronger signal. If he increases his power to 100 watts another 10 db. will be added to his signal and if he increases his output to 1000 watts, or to be more legal, if he adds 10 db. to the gain of his antenna, his signal will be 30 db. stronger than the original 1-watt signal. Now any receiver is capable of handling a 30 db. range in signal strengths. This is by definition an increase of 5 S units in signal strength and the average receiver is calibrated to accept signals from the noise level to an S9 and many receivers are somewhat optimistically calibrated to accept as much as 60 db. over S9. You might in passing ponder the fact that if a 1 watt signal is just even with the noise in your receiver the same station would have to run two hundred and sixty-two thousand, one hundred and forty-four watts (262,144) to give you an S9 signal. Now of course, the average receiver with a 6 kc. or so pass-band and a noise figure of 6 db. or better can hear a signal which is minus 160 dbw. If the station which is radiating one watt is located fifty miles away, the path loss will be equal to 105 db. If by some miracle your two antennas were line of sight and you were using a dipole to receive the signal on, the signal strength would be an S9 or 54 db. over the noise.

Now comes the problem: if K1OXK runs 100 watts to a 10-db. gain antenna, and you use a 10-db. gain antenna on your receiver, his signal is now 40 db. over S9. Still well within the range of an adequately designed receiver; however, we have left out one important item. The average v.h.f.er uses a converter in conjunction with his receiver. The additional gain supplied by the converter may run anywhere from 30 to 45 db. Adding this gain to our system yields a signal strength of from 70 to 85 db. over S9 which will almost certainly overload our i.f. system.

The tales of grief engendered as a result of this tragic situation can be heard any day on the 50-Mc. band. Unfortunately, the blame is generally put on the incoming signal, with no thought toward improving the receiving system. I do not mean to imply that there is no such thing as a broad signal on the v.h.f. bands but I do hold that such signals are in fact few and far between.

There is no exact procedure for determining whose fault it is but there are some check points. For instance, if the noise level of your receiver drops a few db. every time he comes on the air regardless of where you have your receiver tuned, it's your fault. If the signal is very strong, you

Left to right—Ed and Ned, K1HMU and W1HDQ on location at Farmington, Conn., home of K1HMU and his 178-element 144-Mc. moonbounce antenna.



might take off your antenna and substitute a clip lead. If this helps, it's your fault. If he is only bad when you have your antennas pointing at each other, it's your fault. To put the matter bluntly, the likelihood of it being the other guy's fault is so small that you may as well not bother to check. To make matters worse, there are so many guys running 100 watts or more to 10 db. or better antennas, that it just isn't going to do any good to complain about it. You might as well face up to the fact that you have a job to do on your receiving set-up if you want to enjoy your hobby. To give you a target to shoot for let me point out that the equipment at W1BU will allow tuning in a signal 20 kc. or more above or below our own frequency while we are on the air with 1 kw. of a.m. phone. We do use a separate receiving antenna but we have in fact rebroadcast a phone signal whose frequency was only 17 kc. above ours. It wasn't a local signal either. It originated 200 miles away and was only reading 10 db. over the noise. You interested?

### Here and There on 6 and 2

Although DX, skip, sporadic E, etc., has fallen off in recent weeks, we're happy to be able to tell you that activity is still on the increase in the "scarce" areas of North America and there's still a lot to look for in the "hardly ever worked" areas. We'll begin with a report received from KL7FLC who worked KL7AUV for three and a half hours on the night of August 31. Signals were Q5-89 both ways, with Bob (KL7FLC) on phone and Jack (KL7AUV) on c.w. He also worked KL7CUH/ who was mobile in Fair-Alaska. Other than these two contacts. Bob has heard VESBY several times but has yet to work Pete. Now to Pete, VESBY: "KL7FLC was picked up here in picked up Yellowknife on September 2 at 0640 GMT — RST 329-589 with complete fadeout at times. I gave him a call and heard him call me at 0734 GMT but when I turned it back to him after answering the call he was gone. On September 3 again heard KL7FLC at 0440 and again RST 239-599, very bad QSB. No luck!" Here's hoping that by the time this appears in print the contact has been made. Two such persevering souls should be recompensed with a good contact. Pete also says that more VE8 stations are now operating 50 Mc. in Whitehorse, Yukon and Fort Smith in the North West Territory. Word from Whitehorse, Yukon, and Earle, VESAT, advises us that VESCM, VESEW, VESEF and VESAT are all eagerly awaiting 50-Mc. contacts. Frequen-cies to be watched are 50.06, 60.250, 50.253 and 51.0, and Earle ses to swing those beams north and west of VESBY.

Seems that Earle had a wonderful time on the evening of July 26, eavesdropping (?) on a 50-Mc. opening from Battle Mountain State Park near Pendleton, Oregon. Just before leaving the Park at 2030 PDST, he turned on his 50-Mc. converter and thought he'd somehow landed on the low end of 20 meters during a contest. His converter was around 50.05 Mc. and the c.w. signals were so strong that he was able to copy them with no trouble without a b.f.o. As for the phone band, he says he didn't know which signal to listen to next, but did hear from W5, W6, W7, and W0 call areas both c.w. and phone. Receiving setup was an International FCV-2 Converter to a standard car BC receiver, using a 70-inch whip for an antenna. No trace of flutter was heard on even the weakest signals and the majority of phone stations were strong enough to be copied through the ignition noise of the VW (no suppression whatsoever) while traveling north at 50 m.p.h. Another call area heard from in Canada was VE6, another hard one to get. Bob Henry, VE6DB, of Lethbridge, sez that activity is building up on 50 Mc. in that area with about a dozen hams on the band at the present time. During the month of July Bob heard all call areas in the U.S. plus VE4 and was able to work into the W2, 5, 6. 7. 8. 9. 0 areas: also heard the code wheel from VESBY. And from Saskatchewan and VE5GI we learn that 50 Mc. was open on August 31 with very strong signals getting into that area. Graham (VE5GI) worked thirteen stations in Wisconsin, Indiana, Minnesota, Illinois, Kansas, Nebraska and Colorado. He also advises us to keep an eye out for VE5TP who will soon be operating on six meters both fixed and mobile. Just a sample of things done during the sporadic E season is told by Gary, W5WWQ, from Nashville, Arkansas. Gary says that from May 21, 1961 until July 21, 1961, he made 400 contacts on six meters, and that is not counting the V.H.F. Q8O Party in June. 99.4% of these contacts were out of state and included 35 states (34 confirmed) and three countries. At the time Gary was running 12 watts input to a home-brew ground plane at 30 feet; receiver was a nine-tube (greatly modified) Heathkit AR-3 with a homebrew converter. W5WWQ Q8Ls 100% and to date has sent out cards to the 200 contacts whom he contacted during the two-month period previously mentioned, who have already QSL'd him. He will send out the remaining 200 cards as the budget permits. WA2BPE from Corning, New York, sent us a detailed report of his activities on 50 Mc. during the month of August. Although Tom didn't work all the openings he heard, he did hear openings on eleven different days during August, plus two auroral openings. He ses that about half of these openings were not very good ones or were of short duration, but they were still "openings". He also mentions, along with many others, the good "ground wave contacts coming through during the month. Another similar report was filed by Jim, K4KYL, who noted E., openings on thirteen different days during August, with twenty-four different states, Nova Scotia, Ontario and Mexico coming through at various times. Best day of all was on August 1 when fourteen states and Mexico were heard, California also had it's share of Bo, during August as reported by Dick,



Gathering at QTH of WØAZT: Standing, left to right: Claude Maer, WØIC; Wolf Bain, W4LTU. Seated, left to right: WØAZT, Clif McLoud; WØMOX, Louis Breyfogle; W6WSQ, Mel Baer.

W6IEY, and K6KLY. W6IEY heard Colorado, Texas. Washington, Oregon, Idaho and northern California a number of times during the month and worked most of what he heard. Among the interesting things he heard was W7RT setting up a schedule on 144 Mc. with W6NSL and K7LCW and although Dick shifted to 144 Mc. and hoped for a new contact on that band he had no luck. K6KLY says the Es, skip has given out with his last DX QSO being on August 27 with K7LKL in Phoenix, Arizona. W1NKA and K1KKS, both from Massachusetts report "Pretty good" conditions on six meters during August, with openings on August 3, 4, 11 and 13, and Bill, W1NKA heard KP4, VE and XE areas. From Ridgefield, New Jersey, Ken (WA2BDP) sends word of openings in his area on August 3, 4, 5, 7, 10, 12, 19, and 20, with 4's, 5's, 9's and 6's coming through at those times. A busy man these days is Tony, W3JYL, who is busily wiring up the HT-40 that he won at the York Hamfest. Tony noted openings on the 6th and 12th of the month; the first into the midwestern states, Iowa, Indiana, Minnesota, Michigan, Illinois and Kansas The second to Texas, Louisiana and Mississippi. Bob Anderson, K4UMK, of Roanoke, Virginia, has been working our friends in Canada during the openings into Virginia. Recently he has worked VE1BC, VE3CJN, VE3BWH and VE1EF. He also advises us that W4MWD is now running 250 watts on 50 Mc. to a 4-element beam; and K4UDG is now running 25 watts to a new five element beam. Michigan seems to have "had it good" during August, 'cause according to Reg, W8MBH, it was open for most of the month of August. During the day Ohio was heard fairly regularly and during the evening the eastern states were heard, with Texas and Florida heard on August 23 through the 26th. On August 4 at 0230 Z. W8NOH in Grand Rapids, Michigan, worked VESGI on cw. Lou ses signals weren't too good and he lost him on the second "over". Ken, K9GSC, in Wisconsin, noted opening on six different days during the month, hearing twelve states plus VE1 and VE3. More openings than that ses Ken, but he wasn't around to listen in or work 'em. K9PNP in Princeton, Indiana, had good luck in getting two more states toward WAS during the opening of August 11 when he worked K4TNV for North Carolina, and W4SNH for Virginia. He also worked XE10E, VE3CUA and VE1AOM during August's skip sessions. KØGIC and KØRWC both report from Kansas, with slightly different areas heard at their two locations. Dot, ØGIC, in Wichita heard openings on 6 days during the month with fifteen states coming into Wichita. Dave, KØRWC mentions one opening on August 6 when he heard 0s, 9s, and 7s. During this opening KeGIC was hearing Michigan, New York, Ohio and Ontario. Amasing what is or is not heard at different locations in the same

A number of reports have been received from various call areas mentioning the good ground wave conditions during August. WA2BDP ses ground wave conditions were good into New England on August 5th; K3KPA of Philadelphia sex they were good in the early morning hours into New York; K4UMK reports good ground wave into Pennsylvania on August 19; and W8MBH of Detroit, Michigan, reports exceptionally good ground wave into Grand Haven, Jackson and Lansing during the month. K9PNP in Indiana mentions that August 2 was a good one for him when he worked K6RAX at 8t. Louis, Missouri, on ground wave; and WA2GJT, New York, ses that ground wave conditions for s.s.b. and a.m. were very good during August for contacts into Southern New Jersey and eastern Pennsylvania. Here in the Rhododendron Swannps of Medfield, Mass., we

### 2-METER STANDINGS

W1REZ. 32 W1AZK. 28 W1KCS. 24 W1RFU 24 W1AJR. 23 W1HDQ. 22 W1MMN. 21 W1LZY. 20 K1CRQ. 19 W1AFR. 17	8 1300 8 1205 7 1150 7 1120 7 1130 6 1020 7 1090 7 1180 6 800 6 920 5 450	W51YO 7 4 1330 W51WH 6 3 1200 W6W8Q 15 5 1300 W6NLZ 12 5 2540 W6DNG 9 5 1040 W6AJF 6 3 800 W6AJF 6 3 1400 K6HMS 4 3 550 K6GTG 4 2 806 W6MMU 3 2 950
W2NLY37 W2CXY37 W2ORI37 W2GQI33 W3BLV30	8 1390 8 1360 8 1320 8 1200	K7HKD. 13 5 1130 W7JRG. 12 4 1040 W7LHL 5 3 1050 W7CJM 5 2 670 W7JP 4 2 900 W7UJ. 4 2 235
W2NLY 37 W2OLY 37 W2OLY 37 W2ORI 37 W2ORI 37 W2GQI 33 W3BLV 30 W2AZL 29 K2LMG 25 K2CEH 24 W2ALR 24 K2PAU 25 W2ARJ 25 W2FAU 23 W2FAU 23 W2FAU 23 W2FAU 23 W2FAU 21 W2ESX 23 W2UWI 21 W2ESX 21 W2UTH 20 W2RGV 19 K2RLG 17 K2RLG 17 W2RGV 19 K2RLG 17 K2RLG 17 K2RLG 17 W2RLG 17 K2RLG 17 K2RLG 17 K2RLG 17 W2RLG 17 K2RLG 17 K2R	8 1020 8 1050 8 1060 8 1160 8 1200 8 1200 6 860 7 950 6 753 8 1200 7 1090 6 7700 5 900 6 750 7 1040 8 720 8 720 8 740 8 740 8 740	WSFG 34 8 1040 WSLOF 33 8 1060 WSLOF 33 8 1060 WSRMH 32 6 910 WSGGH 32 8 1180 WSBAX 32 8 960 WSNOH 31 8 1090 WSSVI 30 8 1090 WSSVI 30 8 1090 WSLEW 30 8 860 KSAXU 29 8 1050 WSLEPD 29 8 850 WSURN 28 8 680 WSURN 28 8 680 WSURN 28 8 720
W3RUE 33 W3GKP 31 W3SGA 31 W3FDF 30 W3KCA 28 W3BYF 28 W3EPH 32 W3LNA 21 W3NKM 20 W3LZD 20	8 1100 8 1180 8 1070 8 1125 8 1110 8 1070 8 1000 7 720 7 730 7 650	WSILC . 25 8 800 WSJWV . 25 8 940 WSGPN . 23 8 940 WSGPN . 23 8 540 WSLCY . 22 7 680 WSBLN . 21 7 610 WSGTR . 17 7 550 WSRLM . 17 7 550 WSRLM . 41 9 1160
W3 LZD 20 W4 HJQ 38 W4 HJQ 38 W4 HJK 37 W4 ZXI 34 W4 LTU 34 W4 LTU 34 W4 LTU 34 W4 LTU 34 W4 LTU 32 W4 RMU 25 W4 RMU 20 W4 W4 LTU 30 W4	8 1150 9 1280 8 950 8 1160 8 11149 8 1120 8 1040 8 1040 8 1040 8 7 1130 8 850 6 725 6 720 7 1080 6 720 8 830 7 7 1080 6 650 6 590 6 757	WØLFE28 7 1050 WØQDH27 9 1300 WØRUF23 7 900 WØMOX .22 6 1150 WØINI21 6 830 WØTGC21 7 870
W5AJG32 W5FYZ29 W5JWL29 W5DFU28 W5PZ27	9 1215 9 1360 9 1275 7 1150 9 1300 8 1300 7 1000	WØRYG 20 8 925 WØIC 19 7 1246 WØAZT 18 7 1100 WØJAS 18 6 1130 KØAQJ 18 6 1120 WØIFS 16 6 1100
W5LPG 25 W5KTD 23 W5ML 16 W5FSC 12 W5HEZ 12 W5CW 11 W5CW 11 W5NDE 11 W5KFU 11 W5KFU 11 W5KFU 11 W5KFU 11 W5KPU 10 W5EDZ 8	7 1000 8 1200 5 700 5 1390 4 740 5 1180 5 625 4 1300 3 1200	VE3DIR. 30 8 1330 VE3AIB. 28 8 1340 VE3BQN. 19 7 790 VE3AQG. 18 8 1300 VE3DER. 17 8 1340 VE3HW. 17 7 1350 VE3HW. 17 7 1350
W5YYO7	4 1330	KH8UK1 22 2540

The figures after each call refer to states, call areas, and mileage of best  $D\dot{X}$ .



178 elements on 144-Mc. moon bounce, by K1HMU.

noticed good ground wave conditions during all of August and the first two weeks in September; good into New York, New Jersey, eastern and western Pennsylvania and Delaware.

S.a.b. activity on 50 Me. is still building up. Torn, WA2BPE, tells us that he has been working W3GWP in Taylor, Pennsylvania, (120 miles) and K2PCG in Livingston, New Jersey (230 miles) quite regularly on 2-way sideband. W3GWP is running about 100 watts and K2PCG about 400 watts. WA2GJT comes through with the news that he has worked W9HGE and W8BSW several times 2-way s.a.b., and that he has 20 states worked, s.a.b., since July 4, 1961. Jim also mentions that K2MLB is running 11 over 11 beams and with 5 watts output runs a tremendous

signal. WelEY from La Mesa, California, fired up his sixmeter a.s.b. for preliminary checkout and tune up, then discovered that all of his crystals were in the c.w. portion of the band so couldn't finish up. Perhaps it's "on the air" now but not at deadline time.

Just received wor! from KL7FLC that on September 16 he worked VE8BY, VE6IP and KL7AUV.

A few more reports have been received concerning the Perseids Meteor shower in August, some made their contacts, some made near misses and others just had no luck at all, Ernie, W7LHL, reports his sked with WØMOX on 144 Mc. paid off and they made contact on the 13th, with the longest bursts being 15 seconds. Ernie was running a to p.p. 4X250Bs and using a 6-element Yagi. Sam, K4EUS, had a half-hour m.s. sked with W5FYZ on 11th, 12th and 13th, and each heard the other at various times during the sked period, however not at the right time nor enough heard to make it a contact. W5LUU was not heard at all by K4EUS although Sam was copied for one burst at the other end. Sked with W5KFU in Dallas, Texas, did pay off with a contact during the last 15 minutes of their schedule; making it a new state for Sam. /25 on 144 Mc. Three new states were added to the list of Louis, WOMOX, during the Perseids; skeds with W7FGG in Arisona, W5KFU in Texas, and W7LHL in Washington all "paid off". The contact with W7LHL is the first Colorado-Washington contact on 144 Mc. Louie says the effort put into the kw. 144-Mc. transmitter was well worth the effort and all gear on that band is working fine. In Benton Harbor, Michigan, Jack, W8PT, had a Q8O with W5KXD in Texas on August 12 to bring his total up to 38. He also worked WØENC and heard pings from W7LEE but nothing at all from K5TQP of K7IDD. Jack also mentions that the 220-Mc. net is still operating in that area; W8GOV-220.076, K8JZR-220.050, W8CVQ-220.056, W8PYQ-220.148 and W9REM-220.073. John, W7RT, had no luck on his sched-ules with WA6MLX or W9AZT, but did hear W9MOX in Colorado signing off with W7LHL. Called him for over an hour but - no sked, no contact. Although he didn't work anything this "heard" Ø was John's first taste of a Perseids signal and he is now convinced and will be on 144 Mc. as often as possible during the week ends. He is running 800 watts input, beam is a 13-element Big Bertha, and he's using two converters and two receivers. Wonder if he's ambi-dextrous! WØAZT advises us that he picked up K6HMS during the June 8 meteor shower and W6WSQ during the Perseids, bringing his total to 18 states on 144 Mc. Clif ses that he worked K7HKD in Cheyenne, Wyoming, on the night of September 11 and that Harold is now putting out a "wallopin' signal". He has recently put up a new 44element beam and is using a newViking 6N2 Thunderbolt on 144 Mc. Denison, Texas, is once again on the map v.h.f.wise; Dave, W5SWV, is once again back on the v.h.f. bands running 500 watts on 144 Me, to a 32-element beam 86 feet up; 50 watts on 432 Me into a 32-element beam, 91 feet up. Dave worked Illinois for his 11th state on 144 Mc, worked

100			100
	tinued		

220- and	420-Me. STANDINGS
2222	***************************************

220 Mc.		W9EQC11	5	740
W1AJR11 4	480	W9JC85	2	340
W1AZK 9 3	412	W9JEP9 W9OVL6	4 3	540 475
W1HDQ11 5	450	W9UED4	4	605
W100P12 4 W1RFU15 5	400 480	W9UED4 W9ZIH10	5	500
W1UHE11 4	385	KØDGU5 KØITF6	3	425 515
W2AOC 13 5	450	KH6UK1	1	2540
K2AXQ8 3 K2CBA13 6	230 650	VE3AIB7	4	450
K2DIG4 3	140	420 M		
W2DWJ15 6 W2DZA12 5	740	W1AJR10	4	410
K2ITP11 5	265	W1HDQ8	3	210
K2ITO 11 5	265	WIMFF 8	3	170
K2KIB12 4 W2LRJ 10 4	300 250	WIOOP11 WIRFU7	3	390 410
W2LRJ10 4 W2LWI12 4	400	WIUHE6	4	430
W2NTY12 5	300	W2AOD 6	4	290
K2PPZ11 4	190 540	W2BLV 12 K2CBA 5	5	360 225
K2QJQ13 5 W2SEU4 2	150	W2DWJ10	4	196
K2UUR 4 3	105	W2DZA5	3	130
W3AHQ4 3 W3FEY10 5	180 350	K2KIB4 W2NTY3	2 2	100
W3JYL 8 4	295	W20TA10	4	300
W3JZI 4 3	250	K2UUR7	3	175
W3KKN 10 4 W3LCC 8 5	255 300	K3EOF6 W3FEY7	3	250 296
W3LZD 15 5	425	W3RUE2	2	96
W3RUE9 5	450	W4HHK6	4	550
W3UJG13 5 W3ZRF5 4	400 112	W4VVE7 W5HTZ5	4 2	430
W3ZRF5 4 K4TFU8 4	400	W5RCI10	3	600
W4TLC4 1	165	W6GTG1	1	180
W4UYB7 5 W5AJG3 2	320 1050	W7LHL 2 W8HCC 3	1 2	180 355
W5RCI8 5	700	WSHRC3	2	250
K6GTG2 1	240	W8JLQ4	2	275
W6MMU2 2 W6NLZ3 2	225 2540	WSNRM3	2	390
K7ICW 1 1	250	W8PT5 W8RQI4	2	270
K8AXU10 5	1050	WSTYY 7	4	580
W8IJG9 5 W8LPD6 4	475 480	WSUST3 W9AAG5	3	255 375
W8NRM 8 4	390	K9AAJ4	3	425
W8PT10 5	660	W9GAB 9	4	608
W88VI6 4 W9AAG9 4	520 660	W90JI6	3	330

The figures after each call refer to states, call areas and mileage of best DX.



# CONDUCTED BY ELEANOR WILSON,\* WIQON

# Field Day 1961

O PERATING Class A in Field Day last June were three YL clubs, the BAYLARC of California the GAYLARK of Texas, and the Chicago YLRL. Complete score information was received as follows from Ellen, W1YYM, of headquarters: Class 2A—

WA6MAO 6 BAYLARC 284-AB-11-2277 Class 3A —

K5SKF/5 GAYLARK 621- B-12-3876 Class 3A —

W9DEQ/9 Chicago YLRL 63-AB-7-153 (First figure QSO total, power, nr. operators, final score.)

The Chicago YLRL had its FD at the Wood Dale, Ill., QTH of K9GUB, Peggy. Using the club call W9DEQ, operators K9s CMZ, CQF, GUB, JDE, JVL, LIW, UHD and W9GME worked 2, 6, 10, and 40 meters until prolonged rains spelled "finis" to the activity.

Operators, loggers, and k.p. organizers for the BAYLARC in San Francisco were K6s EEE, HIW, ZCR; W6BDE, W6QYL: WA6DPN, GQC, JGR, LIZ, LYA; WV6s NOW, PKP. The operating call used was WA6MAO 6.

Individual FD reports received were comparatively few in number this year, but as always the

\*YL Editor, QST: Please send all news notes to W1QON's home address: 318 Fisher St., Walpole, Mass.

gals who did go a-Field-Daying seemed to have the anticipated good time.

Another year, with an ever-increasing number of YL clubs, perhaps heavier participation by YL clubs should be urged or actively promoted. If you cotton to the thought, why not bring the matter up at your next club meeting. It's never too early to plan ahead, and come next June the results should be well worth the effort!

# YLRL Election Results

Congratulations to the following new officers of the Young Ladies Radio League who have been elected to serve for a one-year term, commencing Jan. 1, 1962:

President — Onic Woodward, WIZEN

President — Onie Woodward, W1ZEN Vice President — Lillian Byrne, K2JYZ Secretary — Blanche Randles, K11ZT

Treasurer — Jean Kincheloe, K6OQD
District Chairmen Jane Anderson, W1ICV; Kay Gaynor,
K2UKQ; Irene Akers, W3RXJ; Gladys Biggs, K4LVE;
Anna Harrison, W5DIV; Dee Gustafson, K6JPY; Vera
Woods, W7TGG; Alice Geib, W8OTK; Marge Schum,
K9EMP; Thelma Haas, K6HEU; Sheila Goodhue,
KH6DLD; Geraldine Nichols, KL7ALZ; Bea King,
VE3BFE.

Connie Hauck, K6EXQ, will continue as editor of YLRL Harmonics.

YLRL members issue a vote of thanks for a job very well done to 1961 officers President Doris Anderson, K5BNQ: Vice President Onie Woodward, W1ZEN; Secretary Blanche Randles, K1IZT; and Treasurer Jean Kincheloe, K6OQD. (Note that K1IZT and K6OQD will serve next term in the same office, and W1ZEN, of courses, moves up from the vice presidency to the presidency.)

Custodians of the various awards offered by the YLRL are appointed and serve an indefinite term. Present cus-



Twelve GAYLARKs kept three transmitters running at Pipeline Park in Edna, Texas, for a total of 621 FD contacts. Smiling for photographer W5KFD are front row, I. to r: K5VNW, K5MIZ, W5CXM, K5POD, K5PFF; back row: K5LIU, K5DJS, W5ERH, K5YTT, K5BJU, K5YIT. Not in the picture, but also on hand, was K5VZB.







(Left) The new YLRL vice president is Lillian Byrne, K2JYZ, of Freeport, Long Island. Licensed since 1954, Lil works 10, 15, 20, and 40 phone and c.w. A high scorer in several AP and YL-OM contests, Lil has a Code Proficiency Certificate for 20 w.p.m. Hams in K2JYZ's family are OM K2JYM, daughter K2ZUX, and son K2UNO.

(center) This past year's YLRL vice president, Onie Woodward, W1ZEN, has been elected president for the 1962 term.

Very active in YL nets and groups since she was licensed in 1953, Onie has been an officer of WRONE, and in 1960 she co-chairmanned the 3rd YLRL International Convention at Cambridge, Mass. The XYL of W1RCJ, Onie works all bands, 75 thru 2 meters, at her Marlboro, Mass. QTH. Her certificates number over 40, including YLCC-400.

(Right) Elected for a third term as YLRL Treasurer (a first in club history) is Jean Kincheloe, K6OQD, of Glendora, California. Jean, who works any band 2 thru 75, when she "gets a chance," has been studying braille in order to transcribe radio material for blind hams.

todians are as follows YL Century Certificate — Katherine Johnson, W48GD; Worked All States YL — Grace Ryden, W8GME; Worked All Continents YL — Barbie Houston, K5YIB; DX-YL Award — Maxine Willis, W6UHA; Continuous Membership — Bettie Mayer, K7BED. Vada Letcher, W6CEE, is club Librarian.

#### YL Nets and Round Tables

(Effective Sept. 1, 1961)

The following list of YL nets and roundtables has been received from YLRL Vice President Onic Woodward, WIZEN. If a net has been omitted, it is unintentional and the NCS or manager is invited to submit the name, time, frequency, and NCS of the net to WIZEN, 14 Emmett St., Marlboro, Mass. Corrections and additions will appear in this column.

Citto Con	CARDAD+		
Time (GMT)	Freq.	Name	NCS or Manager
Monday		21 GMC	.m anage ;
1300	3920	U.P. Michigan YL	W8HAV
1400	7225	Floridora	W4IUR
1600	7235	Loaded Clothesline-Phone	KØEVG
2300	3890	Oregon YL	W7HHH
0400	29,600	Dark Eyed Queen	W9GME
0400	50,560	Baylarc 6 Meter	WA6ALK
Tuesday	,		
1330	3900	Blue Ridge	K4CZP
1400	7215	Floridora YL SSB (Lower)	W4UF
1400	50,200	Hawk Roost	K9MZV
1500	50,330	Southern	Floridora
1600	3940	Kansas YL	KOHEU
1800	29,130	Hairpin	KGJPY
2100	7230	MontIdaho	K7BKH
2200	7105	Finger Tip-C.W.	K6ZCR
0100	51,000	Rhode Island Yl.	WIGSD
Wedness	lay		
1330	3900	Yankee Lassies	KIIJV
1400	7185	Floridora Novice	K4RDX
1430	3900	YL Welcome	W8ATB
1500	3840	Wisconsin YL	K9TUD
1630	7150	Loaded Clothesline-C.W.	KØEVG
1730	21,390	Cross Country	KZ5VR
1900	14,260	YL SSB (Upper)	K5BJU
1900	7230	Hawk Roost	KOTCM

1900	50,650	WRONE 6-Meter YL	K1IJV
0300	146.1 Mc.	Los Angeles YL	K6BUS
Thursde	ay.		
1400	3880	TYLRUN	W5JCY
1400	7260	Georgia Peaches	K4ZZS
1400	7270	Friendly Forty	W3UUG
1600	7235	TYLRUN	W5JCY
1800	14,240	Tangle	KØEPE
0000	50,500	HAWK Roost	K9IXD
0100	50,300	Floridora (Central Fla.)	K4ANR
0100	50,330	Floridora (So. Fla.)	K4LPR
0100	50,250	Oklahoma YL	-
0400	3915	CHIRP	K6HHD
Friday			
1730	7250	Calif. YL Roundtable	W6QGX
1900	3600	WRONE YL C.W.	KILIV
Saturda	y		
1430	3910	HAWK Roost	K9ILK
1800	3850	Mermaid	W6QYL
Sunday			
1400	7995	Floridora Rusiness Girl	KAUTZ



The first YL to operate s.s.b. in Finland is OH2CM of Helsinki, according to OH2XK, who forwarded Fia's photo. Licensed as a novice in May 1960 and as general class a year later, Pia has won two OH awards for her operating on 14-Mc, s.s.b. Pia's OM is OH2KL.







(Left) EL4YL, Traute Bale, of Monrovia, Liberia. A registered nurse and the XYL of EL4A, Traute operates on the even days of the month, 160 thru 6 meters, phone, c.w. and s.s.b. (Photo via WIWPO)

(center) Here's a new DX YL to look for, and so far as her OM KM6CC can check, Misty Tyrer, KM5CF, is the first YL to be licensed on Midway Island in the Pacific. Licensed in July this year, Misty is on 15 and 20 phone and c.w. A registered nurse, KM6CF is presently working as an audit clerk for the Navy Exchange on Midway.

(Right) While her OM is presently on Okinawa as field engineer, Opal Monsees, KN3NKE, of Washington, D. C., is putting the family Collins S-line gear to proper use. Opal hopes to have her General Class license by the time Art (operating KR5AM) returns.



Colorado YLs all and all members of the new "Colorado YLs" club. Gathered for an August meeting at the QTH of KØWZN at Palmer Lake were front row, I. to r. KØEPE, W6AAX/Ø, K5OPS/Ø, KØRGU; back row, KØWZN, KØUMS, KØSQK, KØRXK, KØZSQ, KØBTV.

[See New Club and Certificate]



Six-meter enthusiast Frances Adams, K4PPX, is the winner of the Florida Skip v.h.f. WAS contest. The XYL of K4QQE, Floridara YLer Frances has 42 states and 6 countries confirmed on six. (Photo courtesy W4IYT, editor Florida Skip)

### Flying YLs

In response to an earlier request for information on YLs who hold a rilot's license, Clif Evans, K6BX, has as members of his Flying Hams Club the following YLs; WISVN, W4UF, W4ZKD, W6QPI, and W8OMH.

Not on Clif's list yet, but certainly most worthy of mention, is Rhea Hurrle, K5RDY, who is one of the first five women in the United States to undertake space-astronaut training. A pilot-secretary for an aviation company in Houston, Texas, Rhea learned to fly five years ago and now has over 1300 hours with single-engine land and sea, multi-engine, commercial, instructor, instrument and instrument instructor, Link instructor and some of the ground instructor ratings.

# Coming Events

YLRL Anniversary Party — The 22nd annual party for all licensed YLs. Phone portion Nov. 8 from 1700 GMT to Nov. 9, 2300 GMT. (C.w. portion Oct. 25 at 1700 GMT to Oct. 26, 2300 GMT.) Rules in Oct. column.

TYRLUN Anniversary Party — Nov. 4, Brownfield, Texas hostessed by GABS. Contact Irene Lewis, K5LSO, 1004 So. 6th St., Brownfield, Texas.

Alamo YL Week — Nov. 5-11, sponsored by the Alamo YL Club of San Antonio, Texas. Work club members for Alamo Certificate. Texas stations contact 4 members; all others contact 3 members. Send list and 10 cents to Ines Cole, W5WXT, 320 Meadowbrook Dr., San Antonio, Texas. WRONE Luncheon — The annual fall luncheon of the Women Radio Operators of New England will be held Nov. 5 at the Red Coach Grill in Saugus, Mass. Special guest KH6CKO, Kay, will give an illustrated talk on the charms of Hawaii. Special favors direct from KH6 land to all who attend. Contact one of committee for reservations W1VPF, chairman, W1SVN, or W1VYH.

### New Club and Certificate

On July 22, 1961 the "Colorado YLs" club was organized. Charter officers are Pres. KBEPE: V.P. KBETV; Secy.-Treas. K5OPS/#); Pub. KØZSQ; Certificate Custodian K#RGU; Historian K#WZN. Other charter members are K#SQK; K#UMS; K#SPW; WBEVT (the first licensed YL in Colorado; K#RXK; and W6AAX/#. Charter membership is open until Dec. 31, 1961. All licensed Colorado YLs are invited to join. Send annual dues of \$2.00 to Ethel Chastain, K5OPS/#, 851 Victor St., Aurora, Colo.

A certificate, the "sYLver doll-ar" will be awarded to any amateur who contacts five Colorado YLs after July 1, 1961. Send list of contacts with 50¢ to Tillie Curington, K@RGU, 2067 Brentwood St., Denver 15, Colorado. Do not send QSL cards to custodian but do QSL the contact.

# Keeping up With the Girls

When W1HOY was asked to speak to the women who attended the Central New England hamfest, the program read "Helen Harris, WIHOY, will speak about WRONE Women Radio Operators of New England) and women in ham radio." A newspaper clipping concerning the event read "Helen Harris, WiHOY, will speak about 'The Wrongs of Women in Ham Radio'." Ahem! . . . In con-junction with the new YLRL activity "Ladies Day" (second Monday of each month reserved for ragchewing with YLs) Margaret, K5MXO, and Helen, W5LGY, urge OMs and YLs to specifically call "CQ YL" for better results. Lis, K5YIT, is justly proud of her all-ham family. OM Fred is W5AF, and three sons are K5ZWG, K5QFW, and WA6QOI. . . . While in Europe, Eunice, W1UKR, enjoyed a visit Carola, OH5SM, on her 4500 acre farm near Helsinki. Other W YLs reported touring Europe recently were W1VPF, W1YWT, W4LKM, and K4RED. . . . Barbara, W1TRE, who has been operating DL4ZO, expects to be back in the U.S. in October before returning to Germany for six months to two years more. Of 2500 hams who attended the German convention at Dortmund, Barbara was the only licensed U.S. ham, and the only foreign YL. . When YLRL President K5BNQ, Doris, was unable to appear at Oklahoma City for a TV program on ham radio, June, K5UIM, ex-KL7AZI, substituted and told of her experiences as an Alaskan YL. . . . W4WBR, Ruth, re ceived an A-1 Operator's certificate, and Camille, W3TSC, proud of her Quarter Century Wireless Award. . K8MZT, Shirley is custodian of the new Ohio YL Award mentioned in the August issue. Send list of contacts with 25 Ohio YLs made since end of World War II to Shirley Rex, K8MZT, 2225 Mt. Vernon Blvd., N.W., Canton 9, Ohio. The Buckeye Belles, a new organization of Ohio YLs, also issues a certificate for contacts with 10 Ohio YLs for outof-state applicants, 20 Ohio YLs for applicants in Ohio, and 5 for DX operators. Send 25¢ and log information to custodian Marie Helminski, W8MBI, 3943 Concord St., Toledo, Ohio. (Thanks to K8MZT for this information correcting items in the Aug. and Sept. columns.) . . . We are sorry to record the death of Christine Sprague, W1YPG, who passed away suddenly on August 11.

# It's Time to Convert!

As you are undoubtedly aware, the ARRL for some time has been urging the use of Greenwich Mean Time in amateur work. In keeping with QST policy, hereafter in this column when



Feted at a gala going-away party by K5YIT and members of the Gulf Area YLARK and their OMs were Mildred and Fred Wright, K5LIU and W3RRI, on the occasion of their move to Raleigh, N. C. Mildred, a past vice pres. of YLRL, is a charter member of GAYLARK. (Photo by W5KFD)

the reference is to operating matters, contests, etc. (not meetings or hamfests) the time used will be GMT.

The chief advantage of Greenwich time is that it is a universally understood reference throughout our radio world, hence it makes good sense for everyone to use it.

The Call Book contains a convenient world time conversion chart, and in every issue of QST under "Operating News" may be found a simple GMT conversion table. Or, write to ARRL for a copy of Operating Aid No. 10, a handy conversion chart that you can post at your operating position.

Don't be afraid of it — once you have tackled the conversion a few times, it's easy really. Start keeping your log in GMT today!

# New Apparatus

# Alphlex Heat-Shrinkable Tubing

NEW plastic tubing, developed by the Alpha A Wire Corp., has the property of shrinking to a predetermined diameter after the application of heat. It can be slipped over wires, cables, terminals, tool handles, and connectors, then heated and shrunk to form a secure, tight-fitting, insulated sleeve around the object. The temperature required to start the shrinking process is about 235 degrees F., and full shrinkage will take place within seven seconds at 275 to 300 degrees F. The heat can be supplied by an oven, radiant heat, dipping in hot liquids or simply with a soldering iron, burner or match. After the tubing has been applied and shrunk, it remains flexible and strong through the temperature range of - 67 degrees F. to 235 degrees F.

Alphlex shrinkable tubing is sold in standard

packages of 4-foot lengths in several diameters (from .027 to 1.036 inches i.d. after shrinking), and colors. The tubing is sold through electronic parts distributors.

— E. L. C.





# Correspondence From Members-

The publishers of QST assume no responsibility for statements made herein by correspondents.

### LICENSE FEES

 $\P$  I disagree 100% with your license-fee stand as expressed in September QST.

I want my amateur radio station and operator's license to have equal status with all other radio licenses. If WRCA is required to pay for a license, I think I should be required to pay (maybe not as much) and have equal rights on the air. (Not on same frequency!)

When a neighbor complains to me he hears me on a "two bit" a.c./d.c. radio, I want to be able to look him straight in the eye and say, "Go to . . . I've paid for my license just like WPDQ, the station you are listening to, and have equal rights."

I don't want amateur radio to sink into a "free loader" status if other services must pay for their license. A "free loader" never commands respect from anyone. — O. W. H. Johnson, WAKVH/KIQLZ, Vicana, Virginia.

¶ Please accept my congratulations for your fine editorial concerning amateur license fees. Your coverage was complete and your logic excellent. It makes me glad to be a member of your organization. — William H. Boyer, W3AMQ, York, Pennsylvania.

 $\mathbb Q$  I am quite happy that the League is taking a stand against fees. I, too, feel that this is an example of unwanted Government intervention.

I do, however, disagree with the statement, . . . "Charging a fee for the privilege of spending one's time and money solely to acquire skill in the field of electronics is . . ." This statement, on our part, is unjust. I am certain that FCC is not charging the fee for any such privilege. You yourself, in a previous editorial statement, said that the fee was charged to "make the service as self-sustaining insofar as consible."

I think it important that all amateurs understand just what the fees are for — particularly if the legislation goes through. — John R. Miller, K9BIV, Macomb, Illinois.

¶ I look forward each month with a great deal of pleasure and anticipation for my QST; no other so-called amateur publication comes even close to your quality. However, I may not always agree with your point of view. Specifically, I feel that a charge to defray the cost of license-issuing isn't bad; the cost of government and its services are skyrocketing all out of proportion and if all amateurs want their licensees bad enough, as I do, the minimum fee is not out of sight. The fee should be charged for examination (not necessarily for license issuing) as too many "characters" take the exam at the FCC who aren't properly equipped therefor! . . . − Benjamin Bergman, WA6JJP, Lemon Grove, California.

¶ I agree with your editorial 100%. Count me as a voter against license fees for amateurs. — Albert W. Boehnlein, W8BEZ, Garden City, Mich.

€ It does seem only just that amateur radio station and operator licenses should be issued non-fee for an indeterminate number of years to come. It would seem feasible at this time to subject agencies using the service for profit to a license fee to remove the financial burden from the tax mayer. However, such a move should in no way enable future legislation to construe the meaning of the act to include the amateur. — Randolph C. Blodgett, WA2DEW/KV4CQ Bloomfield, New Jersey.

€ Seems to me it's about time the FCC took some action
to cut down "mail-order" licensing. By paying a fee, we
should become self-sustaining and have a small voice in
demanding better supervision in conducting amateur
ticensing.

FCC has indicated in many publications that the reason why Novice, Technician and Conditional licenses are made by mail, is the lack of funds to have engineers conduct same. — Louis A. Gerbert, WSNOH, Grand Rapids, Mich.

#### OM .

¶ I am sorry for K4TDN/3, myself and anybody who has to work me and some other doddering old fools who can no longer form Morse characters as clearly as the tape from W1AW. I noted several years ago that an older man had a very choppy fiat and since then have come to regard such choppiness and distortion of the code ("and" may come out "pd") as a function of age. Maybe it is our museles rebelling. Anyhow, I find myself sending unrecognizable code and then I go back and redo it, getting it right the third time. Who wants to work a lid like that? Or else I can turn it out carefully but only at the rate of 10 or 12 w.p.m. Old age is a sad thing. But just give us a QLF (who knows what QSD means nowadays?) and we'll try to do better. — Alexander A. McKenzie, W2SOU, ex-WiBPI, Hackensack, New Jersey.

## OLD "PRO"

¶ I'll be coming back on the air in my retirement after some 42 years on the air as an amateur, and in the past a many-year member of the ARRL.

Naturally I want to come up to date, and find out what the latest thinking in Hartford is. I need to be educated. Otherwise I'll be using my 750-pound power supplies and other maximized rock-crusher gear that's the hallmark of the old timer.

No doubt about it -QST does a good job of reporting the field. And I'm saying his from a professional point of view, having served as an editor of Time, writer for Life, syndicated columnist, and writer for the national and international editions of the Reader's Digest. — Harold Churchill,  $ex-W\bar{s}ZC$ , Princeton, New Jersey

### A LITTLE PATIENCE

¶ In appreciation for what other hams have done for me, I must comment on Eugene Bosinski's letter (September QST). Either he has had the wrong approach or has been unfortunate in meeting a few uncooperative hams, who are in the minority.

When I received my license several years ago, radio theory was not one of my strong points. Consequently, there were many times when I was seeking advice from members of our club or others whom I had met. Sometimes questions were answered on the spot. At other times I went to their shack or they came to mine.

I just want to say that there are many hams who gladly give of their time and talents to help a beginner and they ought to be given a pat on the back. — Leif A. Nelsen, W9ZXG, Chicago, Illinois.

¶ As president of a radio club, I feel compelled to reply to a letter which appeared in the September issue of QST from Mr. Eugene Bosinski. The failure of a president and secretary of a radio club to acknowledge a letter from a fellow ham seeking aid is a gross breach of amateur protocol. Paragraph four of The Amateur's Code reads in part... "The Amateur is friendly ... i friendly advice and counsel to the beginner...". If the club to which he refers was unable or unwilling to offer assistance it could have at least said so.

When I became interested in amateur radio a number of years ago, I experienced Mr. Bosinski's dilema exactly. There were two hams in the office where I worked—one General and one Extra. They would not even talk to me much less offer five minutes of advice. I believe that I now (Continued on page 168)



# Operating News



F. E. HANDY, WIBDI, Communications Mgr. GEORGE HART, WINJM, Natl. Emerg. Coordinator JOHN F. LINDHOLM, WIDGL, Ass't. Comm. Mgr., C.W. ROBERT L. WHITE, WIWPO, DXCC Awards LILLIAN M. SALTER, WIZJE, Administrative Aide ELLEN WHITE, WIYYM, Ass't. Comm. Mgr., Phone

How Many Can You Claim? W3SMV and W4UWA/K3KMO report organizing a club called the Brass Pounders Amateur Radio Fraternity. Besides basic requirements that applicants show proficiency in constructing some of their own equipment, have worked a club member and have been licensed at least five years as General Class or higher, applicants must, it is said, meet at least six of the following ten requirements:

(1) Hold ARRL CP certificate for 25 w.p.m. or higher

(2) Hold ARRL appointment as ORS.

(3) Submit proof of c.w. work with 50 countries.

(4) Hold Advanced or Amateur Extra Class License.

(5) Show proof of c.w. QSO with W1AW.(6) Hold A-1 Operator Club certificate.

(7) Hold BPL.

(8) Currently show membership in section level (or above) traffic net.

 Have log verification of having completed 1,000 c.w. contacts.

(10) Be on the air, using c.w. an average of five hours a week.

We found this an interesting exercise to check off the points to see if we personally could make the six, provided we lived in the club area. Perhaps you will like to try the same thing. On points you can't check, we fancy you may want to work for some of these, just for the feeling of accomplishment that may be involved. If you are especially interested in collecting a certificate award for 1000 proven c.w. contacts shown in your log subsequent to 31 Dec. 1956, drop us a line and we can supply a little further data on that.

Pet Peeves. Quite a list of these can be made! We'll recite some for all to know that not all ignorance is bliss. The new ham who belongs to a club scheduling operating talks can generally steer clear of criticisms. It takes dos and don'ts by the old timers and a good question-answer club session to put across some useful procedure points and operating lore. Eavesdropping on good nets, taking part when you can, is also rewarding in operating know-how. The following "pet peeves" are noted by an OO (W9KCR) . . . and include things that go beyond the scope of OO notifications of signal defects contrary to FCC regs. Not that false calls, omissions from call identification, chirps and deliberate interference are not citable by FCC; they are. Perhaps some of these are your pet peeves too?

Have you heard . . . (1) The ham who tests

and never signs - brick on key . . . no dummy antenna. (2) Electronic key adjusters, testing with power on. (3) Persons "on the air" who have not had sufficient keying practice. (4) The "new General" who carries over traits like "R R R sorry, OM, but I missed your QTH and your name" (not sufficiently sharp to know that R means received OK). (5) The ham sending 33 CQ's before signing his call. (6) The one who sends 2 or 3 CQs and signs his call 10 times . . . often calling "CQ DX". (7) Those that interfere with W1AW bulletins and CP unnecessarily. (8) Marks of the Novice . . . "back to you" . . . "AR K". (9) The percentage who send 73's or "best 73" or "best 73's" (73 means best regards). (10) The chap who by poor spacing makes a call like K4SUV come out VK5SU. (11) Fellows who haven't heard the DX, but come on the frequency just because there is a pile up; others who come up on frequency and call while the DX station is sending (Many DX stations properly refuse to answer the fellow that does this.) (12) Those that omit "DE" from between the two calls or leave off prefixes and numerals contrary to FCC regulations. (13) Those with bad chirps?

Why not everybody help by attempting to impart the missing know-how on the spot, or by a tactfully put remark with one's QSL? OOs continue to try to keep people who are out of step with FCC regs out of trouble. Clubs can help by promoting lectures, demonstrations and discus-

sions for fall-winter meetings. Wide-band F.M. nets for Six and Two Meters. A new phase of our hobby that has been growing is the use of wide band f.m. in the sixand two-meter bands. FCC regs are making older two-way commercial equipment obsolete and many amateurs are getting this at nominal prices and putting it into service. The replacements to permit municipal users to meet new FCC regulations will continue through 1963. A "directory" of fixed-frequency wide-band f.m. amateur nets (Issue 3) has been prepared by K4ZAD and may help one's choice of frequencies for such nets. A nationally used as well as a local working frequency is recommended when setting up these equipments, designed for crystal-controlled reception as well as transmission. Affiliated clubs and groups forming f.m. nets may obtain free copies of the directory from Thomas McKee, K4ZAD (1306 Grove Road, Lynchburg. Virginia). He will act on receipt of a stamped self-addressed business size envelope, sending copies as long as the supply lasts.

According to K4ZAD's directory, about 75 cities have f.m. groups working on "Six"; 120 other nets are on various 2-meter channels. Such setups are designated in several cases for local operations. For extended-range voice work and such links in proper band sectors there seems a definite place. There may be a good future for wide-band f.m. in our AREC-RACES emergency circuit plans under amateur auspices, as groups of equipments become available for modification and use.

Should 52.525 Mc. and 146.94 Mc. be Designated as F.M. National Calling and Emergency Frequencies? The first named frequency seems the most popular for amateur f.m. net operations in about 12 states. 52.525 Mc. is suggested by K4ZAD as an NCEF. If users will carefully follow the principles of NCEF work and, in each case, set up for alternate working frequencies, distinctive to their areas, it is believed that the 52.525 Mc. calling channel represents an ideal and efficient amateur utilization of this part of our spectrum. But is there enough f.m. use to justify it? Objections or disadvantages to one or the other of these frequencies? May we solicit your comments and suggestions. For greatest coordination and successful point coverage, it seems advantageous for all stations in a particular county or large community to have two or three common frequencies to use, and also to know of the channels used in adjacent areas, so ample liaison contacts may be made using those too, if required. The six-meter frequency put forward does appear to have in its favor a good degree of freedom from channel two TVI problems.

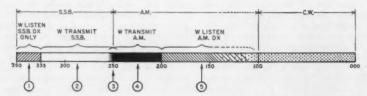
Separate comments are requested from all who would be interested likewise in an ARRL specification of an additional NCEF in the two Meter band for f.m. If set up for it, one can switch quickly from 146.94 to 146.76 or 147.30 Mc. or other channels leading in f.m. usage. As with the selected six-meter frequency, more use would help to populate the upper part of the 144–148 Mc. band advantageously. K4ZAD points out that 146.94 Mc. is in the Technician-permitted frequencies; likewise it is a RACES-plan frequency. Comments from all amateurs are requested please, to help us assess the possible advantages

and disadvantages of another NCEF for operators who use wide-band f.m. Is not this another of these fields where observance of a selected frequency as one of our gentlemen's agreements can only help promote operating success and the Public Service of Amateur Radio?

More on 20 Meters. The "gentlemen's agreement" that W/VEs refrain from using the top 15 kilocycles of 20 meters is rooted in the ARRL Board of Directors purpose to assist in making "DX contact with our amateurs and with each other possible in greater freedom and success." A number of comments have come in on the subject. The following stresses the importance of "control."

"I feel this is especially a problem for the DX station to control, more than for W and K stations. As long as a DX station continues only to listen on his frequency, what is one to do? If the DX station would specify a listening frequency, say listening from 14,280 to 14,300, or some specified frequency, and not acknowledge callers on his frequency, that would be the answer. Or if he said, 'listening for calls from 14,250-14,300 kc., tuning 14,250 up' first, and then announced next that he was tuning down from 14,300, this would help spread out the Ws and eliminate pile-ups. This would also revive detective-work of DX know-how into the game. It should bring back some of the competitive spirit of the period when crystal-control was the vogue." — Gil, W1APA.

Planned Use of 14 Mc. Charted. One correspondent states amazement, "at the misunderstanding and lack of thinking on the basic facts of phone DX working by such a large number . . . including . . . even some DXers." He thinks QST should show by diagrams or otherwise, some fundamentals on band use, covering the Board's recommendation to help W- and DX-operators get best s.s.b. results at the high end of the band. We are indebted to Dale Kentner, W2ZX, for sending in the simple charting of 14-Mc. band segments shown below. The numbered commentary best tells the whole story, we think. The chart shown represents Planned Proposed Usage of 14 Mc. for optimum use of available frequencies, not proposed allocation. Try operating as here suggested, and see if you do not agree this makes your use of the band, be it rag chewing, DX, or traffic work, enjoyable and successful.



- 1. Available mainly for s.s.b. DX to transmit to Ws, and for DX-to-DX s.s.b. QSOs, both free of W s.s.b. QRM.
- Available for W s.s.b., likewise for s.s.b. DX to use for on-frequency work with Ws under "no pile up" conditions (especially off peak occupancy hours).
  - 3. S.s.b./a.m. borderline—a grey area which may vary with time, and the relative activity of s.s.b. and a.m. operators.
  - 4. Available mainly for a.m. (W operators) to transmit. Only 'very hardy' a.m. DX ventures here.
- Available for a.m. DX to transmit to W's, and for a.m. DX-to-DX QSOs, both free of W phone QRM. And below this a grey area which may vary with time, and the activity by phone, c.w. and other modes.

Some Novice Items. WAS. One of the commonest questions ARRL gets from newer amateurs, "Can my cards, confirming certain states worked as a Novice, be combined with those received after I make my General Class ticket, and be submitted to ARRL for WAS?" Yes, indeed, provided your work is from one location. Also for the Worked-All-States Award, the 50 states do not have to be worked in any particular band or mode. Using the different bands for different times of day and distances involved is to be encouraged; we feel it demonstrates your versatility. CP. Novices, Technicians, others: Use our nightly over-the-air ARRL Code Proficiency Program all you can to get your speed up to General Class requirements. Some practice in sending code, along with your receiving practice, will get your speed up there faster. We invite all amateurs to keep on and get our CD Endorsement Stickers for the speeds of 20- and 25-w.p.m., not only as a show piece for your station . . . but so you will have top capability as an amateur with full privileges who can work all bands, to enjoy traffic net operating, go after DXCC with no handicaps and h ld ORS and/or other appointee posts. The SS. Here's an activity all amateurs get into each year. For testing stations, getting new states and QSLs for shack wallpaper, it's unexcelled. It steps up both results and operating ability. Novice Winners got certificates in all but one licensing area last year; Novice's scores of course get compared only with those of other Novices. We invite you to see the SS rules, page 42, and to try your hand. You may end up with the Novice certificate for your ARRL Section.

The 28th Annual ARRL "SS"! Work either c.w. or phone in the Nov. 11–13 18–20 Sweep-stakes and you have a real operating treat coming. All U. S. and Canadian amateurs are invited. The report on last year's results (May QST) shows a "clean sweep" of all sections racked up by 123 operators using c.w. and 15 taking part on phone. Ninety club's members got certificates as local-club leaders. The "SS" is our top ARRL operating event in popularity, leading all other activities in individual entries. Don't miss it.

-F. E. H.



Any change will cause confusion, even if it's a change for the better. By the time you read this, many areas of the country will be moving their clocks back an hour to "rogain" the hour that they "lost" in April when they set them ahead an hour. A few months ago we received a terrific bawling out from the field for harping on "daylight saving" time, so we'll not do so again. Besides, now that we're all (?) using GMT, it isn't really necessary. Other people may be changing their clocks, but we don't have to; we just move

# A.R.R.L. ACTIVITIES CALENDAR

(Dates shown are per GMT)

Nov. 3: CP Qualifying Run — W6OWP Nov. 11-13, 18-20: Sweepstakes Contest Nov. 17: CP Qualifying Run - W1AW Dec. 7: CP Qualifying Run - W60WP Dec. 16: CP Qualifying Run — WIAW Jan. 5: CP Qualifying Run - W6OWP Jan. 6-7: V.H.F. Sweepstakes Jan. 13-15: CD Party (c.w.) Jan. 20: CP Qualifying Run - WIAW Jan. 20-22: CD Party (phone) Feb. 2-4: DX Competition (phone) Feb. 3-18: Novice Roundup Feb. 8: CP Qualifying Run -Feb. 16 - Frequency Measuring Test Feb. 16-18: DX Competition c.w.) Feb. 20: CP Qualifying Run - WIAW Mar. 2-4: DX Competition (phone) Mar. 16-18: DX Competition (c.w.) June 9-10: V.H.F. OSO Party

# OTHER ACTIVITIES

The following lists date, name, sponsor, and page reference of QST issue in which more details appear.

Nov. 4-5: New York City QSO Party, Bronx High School of Science (p. 124, this issue). Dec. 2-3: 21/28 Mc. Telephony Contest,

RSGB (p. 83, this issue).

June 23-24: Field Day

Dec. 9-10: Kansas Centennial QSO Party, Kansas Federation of Amateur Radio Clubs (p. 128, this issue).

Dec. 9-10: New England QSO Party, Conn. Wireless Assn. (p. 132, this issue).

some of our schedules back an hour and let the old 24-hour clock on the wall alone.

This GMT business can be confusing, though. We are trying to learn to use it exclusively, and even think in terms of it, but like everyone else we are so accustomed to thinking in terms of local time that we find ourselves unconsciously converting GMT to local time so we'll know what time it is, instead of getting used to the GMT equivalents of getting-up time, lunch time, dinner-time and geing-to-bed time. We are also having difficulty getting used to changing the date at 0000 GMT, which doesn't come in the middle of the night where we are. We're used to thinking of the next morning as "tomorrow" and the evening before as "yesterday," and when this "ain't necessarily so" when you're using GMT, it's confusing. It's strange to note that a net which operates at 1930 EST Monday thru Friday is operating at 0030 GMT Tweaday thru Saturday; and this is a change that takes getting used to.

We know that for many years we will have among us some amateurs who will persist in using local time (one even alleged that this GMT move was communist-inspired!) and dragging their feet like the very dickens before changing (and some will die first). Nevertheless, we want to go on record here as urging that all traffic men use GMT in their filing times on messages, and that the dates of origin on message reflect GMT, not local time. In any event, at the very least the filing time should indicate what kind of time you are using, as should any other reference to time, for that matter—at least until we all get used to it and it can just be assumed that GMT is meant.—WINJM.

We quote some words of wisdom from the pen of W4AKC, vice director of the Roanoke Division, appearing in "SCN." the bulletin of the South Carolina Net: "The difference between a mediocre net and a good net often lies in just a little bit more enthusiasm. Enthusiasm is an indispensable ingredient of a successful net. Even the most Iaconic mem-

ber of a net can scarcely resist genuine enthusiasm displayed by the others, particularly the old timers. Without enthusiasm for the objectives that the net has set for itself, the sessions are dull indeed and the routine of the task is almost unbearable. The responsibility of sustaining a high degree of interest belongs to the Old Timer. Quite often he must give a "shot in the arm" to the newcomer who begins to show signs of declining interest."

Net reports. Eastern Area Show Net 31 sessions, 133 check-ins, 44 traffic. Twenty Meter Interstate S.S.B., 20 sessions, 505 check-ins, 1538 traffic. 7290 Traffic Net, 46 sessions, 1527 check-ins, 587 traffic. Early Bird Transcon Net, 193 check-ins, 323 traffic.

National Traffic System. We have often said that there is nothing wrong with NTS that strict adherence to the operating principles would not cure. This is all very true as a philosophical statement, but in practice it can be fallacious, because the practicalities of any plan are part and parcel of the plan's worth. The original NTS plan was sound enough, theoretically, but in practice it was discovered to have flaws simply because the people who implemented it were human and had human failings, and because the wherewithal to implement it fully simply was not available. For example, if we had stations on the East Coast with kilowatts, directional arrays and high traffic savvy, possibly they could report direct into PAN and transmit and receive traffic, if we had stations of similar capability in that net. But it didn't work out this way, because we couldn't find the stations and the operators with the necessary capabili-ties. So the plan was changed and TCC was created, which has worked out much better but is still a long way from perfect.

Similarly, each theoretical phase of NTS was given a thorough practical test over a period of time sufficient to justify its continuance or, if a more practical alternative could be devised, its abandonment. This, we think, is a procedure which has been more than a little responsible for the success NTS has enjoyed.

Even this, however, can be carried too far. Precipitant abandonment of an idea or procedure in favor of another no more practical is not conducive to progress. That's why we have the various administrative and leadership levels in NTS - so that brakes can be put on changes advocated at one level when consideration at other levels indicates they are not beneficial to the over-all system. It is also the reason why we have engaged rather frequently in long, sometimes rather heated discussions with some of our NTS leaders and with leaders in the traffic field outside of NTS. To the section net manager, the conduct of his section net is of paramount importance; similar concern, each to his own bailiwick of jurisdiction, applies to managers at region, area, TCC and area staff levels, just as we here at the head quarters apply our consideration to the over-all aspect. It is not a matter of one being "above" the other: there is no question of who is "boss," or who has jurisdiction over whom, or who has the final "say" on things. The question is, from one level, how will what I propose affect the system as a whole? Or, from another level, will these proposals, if put into effect, be beneficial or otherwise to all parts of the system?

This kind of mature, far-reaching thought on the part of its leaders is what makes NTS a system instead of a scattered hodge podge of nets.

August reports.

	Ses-			Aver-	Representa-
Net	sions	Traffic	Rate	age	tion (%)
1RN	58	719	.414	12.4	75.6
2RN	59	789	.570	13.4	95,6
3RN	62	872	.309	14.6	99.5
4RN	56	712	.378	12.7	93.7
RN5	59	532	.308	9.0	76.0
RN7	62	586	.320	9.5	47.1
8RN	62	374	.188	6.0	91.0
9RN	61	2074	1.078	34.0	59.4
TEN	92	1057	.417	11.4	53.6
ECN	21	69	.127	3.3	77.8
TWN	31	358	.410	11.5	61.9
EAN	31	1345	.858	43.4	98.4
CAN	31	2405	1.440	77.5	98.91
PAN	29	1607	.714	55.4	98.91
Sections <sup>2</sup>	1021	8271		8.1	
TCC Eastern	1023	712			
TCC Central	893	1944			
TCC Pacific.	1123	1192			
Summary	1715	25618	CAN	12.7	3RN
Record	1973	19991	.895	14.8	100.0

<sup>1</sup> Region net representation based on one session per night or less; others are based on two per night or more.

<sup>2</sup> Section nets reporting (33): SOČAL 6, SCN, NCN (Calif.); ILN (Ill.); MSPN & MSN (Minn.); CN & CPN (Conn.); YN & VSN (Va.); OSN (Ore.); S. Dak. 75 Phone Eve, SDN & NIQ (S. Dak.); AENB, AENM, AENO, AENP Morn, AENP Eve & AENT (Ala.); Tenn. C.W.; SCN (S. C.); CCW (Colo.); WFPN Morn & QFN (Fla.); QMN & Wolverine SSB (Mich.); WSN (Wash.); NTTN & NTX (Tex.); NJN (N. J.); GSN (Ga.).

<sup>3</sup> TCC functions reported, not counted as net sessions.

A big load of traffic from the Chicago Trade Show was responsible for the high traffic total in August, and probably also for our breaking all previous records in that department by a wide margin. Much of the traffic was pumped directly into 9RN, and look at their traffic total!

The 3RN representation for August signifies "the end of a dream," for one of the sections missed a session. W4DLA and K4PQL have been awarded 4RN certificates by Manager W4SHJ, safely returned from the Philippines. RN5 certificate was awarded to K4LNA. Thanks primarily to K8MYU, 8RN's West Virginia representation took a decided upswing in August. We are still looking for a new manager for TEN. VE3BZB's vacation in the Maritimes produced some new representatives from VE1 on ECN. WØFEO is having QRM from work, but manages to keep TWN going, including the fine bulletin he puts out. W9DYG reports a swell traffic meeting at the Central Division Conention in Springfield. W9USR emceed the proceedings and W9DO presided. A panel consisting of W1SMU, K4AKP. W9DYG, W9DO and W5CEZ answered questions fired at them by the audience, WA6ROF has awarded PAN certificates to K6LKD, W7GYF and W7LND. PAN has

#### MEET THE SCM

Here are a couple of brand-spanking-new SCMs, though not new to ham radio by any means. Left is Kentucky's Section Communications Manager, Elmer G. Leachman, W4BEW, who holds several Public Service certificates for various emergencies. The S-Line shown is supplemented by a 75.4-2, and 32V-3, and KWM-2 soon to be mobile. A three-element tribander does the radiating along with a vertical. SCM Leachman has been a ham since 1924.

Right finds W9FWH, Donald L. Holt, at the rig. Don, in

addition to his OBS, OPS, and EC appointments, is the new SCM for Indiana. The Heath Apache, DX-35, and Sixer and HQ-110 make up the rig found usually transmitting on 3910. Don is a member of the Madison County Radio Club, AIEE, and IRE, and has been honored with the Hoosier Courtesy Award.

Experienced hams like these two gentlemen make good Section leaders, and follow the mandate of cleaning house of dead-wood appointees.





moved back to 3675 kc, for the winter months.

Transcontinental Corps. Things are going well in TCC, everything considered. The percentage of unsuccessful schedules is low, as it should be, but we'd like to see it disappear completely. There are 341 TCC schedules in a 31-day month: 124 each in the Eastern and Pacific areas and 93 in the Central area. TCC Directors report only on the results of schedules reported to them, and of course this rules out schedules which have not been set up. We think that the record should show the percentage success of all TCC schedules, rather than just of those attempted, and the "percent successful" column in the table below hereafter will reflect that percentage as a more accurate (though less rosey) portrayal of how our TCC is doing.

August reports

Area	Func-	% Suc- cessful	Traffic	Out-of-Net Traffic
Eastern	102	75.0	1295	712
Central	89	91.4	3958	1944
Pacific	112	86.6	2361	1192
Summary	303	83.6	7614	3848

The TCC roster: Pacific Area (W6EOT, Dir.) — W5ZHN, K6s KCB LKD GID, W6s EOT HC, W46s ROF JDB ECF, K7IEY, W7s ZB GMC DZX, K $\theta$ s IIT DTK EDH, W6s WME WHE 77, KQD.



We have just taken from our source material file for this column a letter from Carl Frans, W5ZHN, dated May. 1961, in which he informs us of his plans and progress for and in Albuquerque (N. M.) AREC. We put it in that file because we liked some of the ideas he presented therein and thought you might like them too. This is a more or less painless way to acquire material for this column, especially since Carl (bless his heart) appends a note at the bottom telling us not to try to answer.

telling us not to try to answer.

Anyhow, the boys in Albuquerque are establishing "classes" of AREC membership based on attendance of drills, equipment, operating ability, training and experience. We present the qualifications herewith not just to give their efforts publicity, but mainly to plant the idea of AREC gradations as a means for increasing interest among your own group. Here's how an AREC member in Albuquerque

is classed:

AREC Specialist: At least 80% attendance, code speed 18 wp.m. or better, satisfactory performance as NTS liaison, holds an Advanced First Aid certificate issued by the Red Cross and has performed satisfactorily certain specifically assigned field problems. Must have mobile set-up for both phone and c.w. and experience in NCSing the net on both phone and c.w. and experience in NCSing the net on both phone and c.w. louring field problems he might be told, for example, that he has lost his mobile antenna, his nike or the final tube in his rig, but to get back on the air as soon as possible. This is the top grade in ABQ AREC.

AREC First Class: At least 70% attendance, experience as NCS on both phone and c.w., mobile on both phone and c.w., ten w.p.m. code speed, has at least a Standard First Aid certificate issued by Red Cross and judged competent

in field operations.

AREC Second Class: At least 60% attendance, has a reliable rig (mobile or fixed), meets NTS standards of procedure, takes part in all emergency operations and simulated emergency tests.

AREC Third Class: Any AREC member who can yell loud enough to modulate a rig and with strength enough to push

a button.

The AREC members are really put through their paces. Combined emergency-traffic nets are being started, code practice is being given, and AREC member candidates for a higher class are being tested. In one field problem, for example, operators are required to locate a "search party" by using a d.f. loop, plotting on a topographical map its exact location and then proceeding to that point.

exact location and then proceeding to that point.

Carl says "maybe I'm reaching for the moon," but he

wants to have the man in the car behind the AREC decal well-trained and equipped to perform a real communications service in the event of need.

If this is a good idea in Albuquerque, some modification of it may be good in your AREC group as well. Anyway, it's another idea to ponder. — W1NJM.

AREC members went into action on July 22 when a flash flood hit portions of El Dorado, Kansas. Torrential rains of five inches or more which fell across northern sections of Butler County sent a surge of water through northeast El Dorado and the Riverside district, flooding homes and several businesses. The Butler County Storm Warning Net

several businesses. The Butler County Storm Warning Net reported river crests periodically and assisted in other phases of the emergency work. K@WRB was net control from radio station KBTO and the following additional amateurs took part K@ OMJ VQC, W@ EHV GQM RFY RGB,—

KØVQC, RC Zone 11, Kans.

At noon on Aug. 4, a short circuit in the overhead power lines in South Russell, Ohio, caused a power failure over four counties in northeastern Ohio. The AREC Red Cross Disaster Services Network for Cuyahoga and Geauga Counties was in operation within 10 minutes with stations using emergency power. Telephone circuits being affected, information concerning power situations in suburban communities, hospitals, water pumping stations and location of portable power equipment for emergency use — all these data were passed to the Greater Cleveland Red Cross Chapter and other safety and service departments by amateur radio. The net was secured after three hours, when power had been partially restored in both counties. K8UFN was net control, operated by K8EXL and K8ZFE. K8DQB operated the Red Cross chapter station. Other fixed and mobile stations who participated were K8s HVH JDQ MBV NYZ SCI UXH VIE, W8HZI. — K8EXL.

During the flooding of Ashton Creek, near Washta, Iowa, on Aug. 8, a father and son were swept into the Little Sioux River while trying to cross a bridge, and amateurs were called upon to assist in the search for the bodies on Aug. 10. Cherokee County EC KIVBM got together with Woodbury County EC KØMMS and Ida County EC KØLXL to form a planning committee to obtain the necessary equipment and operators. The resulting organization brought AREC members of Sac, Clay, Crawford and Buena Vista counties into the operation. The deployment of stations went like this: WøEFG NCS to keep frequency clear and transmit long haul messages; KøLXL for communication between base station No. 1 and NCS; KøVBM for communication between base station and hand-carried units with the search officials; KØEJS for contact between base station one and station two; KØDKM/mobile for liaison purpose K@MMS/mobile as alternate between base station one and the NCS. Other amateurs who took part were KØs YVZ AAU PDI DKM BGH YTO TBO EÏC UGI AAR YHN ERF YTU YTV YTX CEJ BXO, KNØ8 FXX FYC, WØ8 DIT EIY EQN FBY MHC BUM DON YOZ, KØYHN lost both shoes and shirt, spending the day at the search both barefoot and bareback. K@PDI, a trained diver, was on the scene to help if needed. KØYVZ, EC for Clay County, served as NCS and almost lost his voice. Amateurs assisted in the procurement of boats, grappling poles and hooks, airplanes. search volunteers, food and drinking water. The operation was a partial success as one body was found. —  $K\theta VBM$ , EC Cherokee County, Iowa.

On Aug. 19 a forest fire broke out about five miles north of Moscow, Idaho. The base station for Latah County received a call for help from a fire truck at the scene of the fire. W7VQC and W7GHY put the base station on the air and alerted police, sheriffs, forest service and smoke jumpers from Spokane and Yakima. Thanks to this prompt action, the fire did not reach the city. — W7GGV, SCM Idaho.

Five Venezuelan amateurs, in an attempt to save the life of a stricken man in Los Teques, Venezuela, conducted a "radio search" on Sept. 3 for information about a remedy reputed to be under development and effective in similar cases. The Venezuelans concerned were YV5s BFD AQO APS ASF BJA and HN First contacted were WA2OVI and WA2NEJ, who enlisted the aid of New York periodicals in a search for the medicine. Later, WA2OVI tried to locate a prominent cancer specialist in Bethesda, Md., without suc-

cess, while K3LIP and W5PPI stood by. Then W3KXU/4 succeeded in contacting the National Cancer Institute and was informed that the drug was made by a firm in Indianapolis. K9SJF in Indianapolis was contacted, got in touch with the manufacturer and the medicine was shipped promptly to the Caracas physician as a gift of Eli Lilly & Co. Meanwhile, the amateurs transmitted dosage information supplied by a Lilly clinician. Another bright star in the chronology of international amateur radio cooperation.— YV5BFD.

On May 7 the AREC of Hampton Roads Peninsula held exercise "Big Wind," simulating a tornado striking an elementary school. First alarm of the simulated disaster came from a mobile station of an amateur who lives nearby, which was transmitted to net control station W4VMA, operated by K4UOT with W4VMA and K4VJB assisting and handling the two-meter net, CAP dispatched an aircraft to make an aerial survey, their mobile unit going to W4VMA to establish liaison with the AREC at that point. At the request of the NCS, several mobile units of the Newport News police were sent to the disaster area. Simulated emergency traffic was passed to and from the mobile units and the NCS, while mobiles were dispatched on various communications assignments. The exercise lasted exactly fifty minutes, after which participants and their families had a picnic. A total of 23 amateurs participated.— WXVMA, SEC Va.

On May 21 a two-meter radio link was set up by the Fox River Radio League between Aurora and South Elgin, Ill., to provide communications for the first annual Mid-American Canoe Races. Mobile stations with generators, battery-powered rigs, beams and halos made up the link. Stations were placed at South Elgin, St. Charles, Geneva, Batavia, North Aurora and Aurora. The progress of the race was recorted to the officials at the finish line at Aurora by each of the portage points directly from the mobile units. In addition, the local radio station was supplied with receiving equioment so the reports could be monitored and relayed direct to the public. Ten amateurs took part in this fine demonstration of amateur radio capability.—
WSCZA/WSNE.

On May 30 the Steuben County (Ind.) AREC particiosted in the annual Memorial Day parade in Angola. Mobile units spaced throughout the parade helped with the organization of the parade and furnished communications along the parade route. Communications were carried out on 52.525 Mc. Eight amateurs participated. — W4CTU/9, BC Steuben County, Ind.

The Turlock (Calif.) Amateur Radio Club on June 3 and June 17 assisted the Modesto Power Boat Club with their first annual races. The Stanislaus County C.D. van, its power plant and radio equipment were used along with emergency equipment of club station W6BXN, with additional gear provided by TARC members. K6IXA was in charge of the operation, with K6DYM operating W6BXN. Communications were provided for the pits, three safety crash boats, a frogman standby boat and the NCS at the judges stand. The entire operation was on two meters, ten amateurs participating.

On June 9 and 10 the AREC of Cuyahoga County (Ohio) assisted the Antique Car Club in their show at the Berea Fa irgrounds, using modern electronic equipment to serve on an old-time project. Amateurs handled information service throughout the show area, conducted an announcing service for the public address system and provided communications for parade control and race control. The mayor and police department of Berea gave excellent cooperation and the activity was a great success. Nineteen amateurs took part.—W8AEU.

On June 11 the Roanoke County (VA.) AREC furnished communications for a sports car hill-climbing contest at Catawba Mountain. Eight amateurs participated, all using two meters. The Old Dominion Sports Car Club was well pleased with the operation and is looking forward to using the services of the AREC again. — K4PQV, EC Roanoke Area, Va.

July SEC reports were received from 26 SECs (three less than July '60) representing 12,902 AREC members (1851 more than July '60). This is the pattern: we are running behind last year in number of SEC reports, ahead in number of AREC members. Sections reported: Ind., S. Dak., Tenn., Ohio, Mich., NYC-LI, Iowa, Maine, E. Mass., Orc., Wash., Nev., E. Bay, Utah, W. Fla, E. Fla, Ga., S. Texas, Alberta, Kans., S. C. V., Colo., E. Pa., Los A., Sac. V.

A red-faced correction: somehow, we omitted four sections from the list of reporters in Aug. Q8T (April reports). They were So. Texas, W. Fla., Kans. and Wash. This makes the April total 33 reports and 13,132 AREC members, instead of the August Q8T figures shown. It also adds two sections to the 100% list in October Q8T: Washington and South Texas. The mid-year total is thus 180 reports from 42 sections instead of the Oct. Q8T figures.

Ah, me! Sorry, men, we goofed.

## RACES News

Hudson County (N. J.) RACES was called into action twice in August to assist with communications connected with two waterfront fires. The first fire, on Aug. 18, was in West New York, consuming a vegetable



West New York, consuming a vegetableoil plant, three coal piers and syread along a mile of the Hudson waterfront. West New York and Guttenberg RACES were alerted at 1715 EDT and operated until midnight. Amateurs taking part were K2s QMS UXW SGC MWD QHZ DUX, W2s KRE VMQ, W42s HXG CCF QCN DCU, WV2SHN.

The second fire was at Weehawken on Aug. 21, while the first fire was still smoldering. The net was alerted at 0345 EDT, came on the air at 0404, and remained active until 0700. Amateurs taking part were K2s QMS UXE MWD, WA2s SHN QCN.—K2MFF, SCM N. N. J.

On May 13 a combination exercise called "Operation Quake" was conducted by San Mateo County (Calif.) medical, c.d. and Red Cross officials. Amateurs under RACES took part to assist with communications. Two earthquakes were supposed to have struck, one at 0728 and the next at 0736, local time. Major and secondary hospitals were designated, as were shelters and first aid stations. The three amateur RACES/AREC stations were manned to provide communications from the Red Cross shelter in Menlo Park to Sequoia Hospital, with the Sequoia Region Red Cross Chapter in the middle. W6WWJ/6 was set up at Sequoia Hospital with K6TQN and K6MPN in charge and a staff of ten amateurs, some of them with overating mobile units. At the Menlo Park Civic Center K6YQT was set up with W6STY and WA6LQN in charge and a staff of seven amateurs. K6OTR was located at the Red Cross chapter, with five amateurs operating. These three stations handled traffic to and from the San Mateo County Hq station, K6QFO, located in Belmont under radio officer W6CTH, Authorized RACES and DCS frequencies were used. A great amount of traffic was efficiently handled and city officials expressed their gratification for the work done by the amateurs. — W6DEF, EC Redwood City, Atherton, Menlo Park, Calif.

A simulated tornado exercise was conducted on June 5 by Zone 10 C.D. of Cuyahoga County (Ohio) in which RACES amateurs took part. Eight hospitals were furnished mobiles and seven aid stations were furnished fixed stations on ten meters. A complete message center of 30 persons was set up at zone headquarters. Over 80 messages were handled in the one hour period of the test. Thirty-three amateurs took part. — K8DFY, Radio Officer Zone 10 RACES, Cuyahoga County, Ohio.

### ABOUT THOSE NET REGISTRATIONS

Yes, they are really pouring in, and maybe this year's registrations will again exceed all previous years. It has also been opined by at least one source that this year's net directory will be the biggest mess we ever put out, because of the use of GMT.

We would like each person who has registered a net, especially if he has used GMT, to make sure that the proper conversion was made, and to make sure that the days of operation are in accordance with GMT. Check these points carefully.

1. The new net registration card (CD-85, revised 7/61)

### BRASS POUNDERS LEAGUE

Winners of BPL Certificate for August Traffic:

KØLTJ KØJDO/Ø WA2CCF K6GZ WA6HHJ АбННЈ/6

Call	Ortg.	Recd.	Rel.	Del.	Total
W3CUL	264	2359	1821	471	4915
W9JOZ K9OZM	9	1403 1272	1403	112	2817 2550
K6BPI	97	1219	1128	91	2535
WØLGC VE2AZI/W	251	1078	976	89	2394
VE2AZI/W	124	1656	667	39	2386
WØBDR WØSCA	141	775 773	671 769	7	1594 1574
W7BA	9	759	697	52	1517
KØONK	14:3	640	616	12	1417
WSUPH		616 587	550	65	1240
K4AKP W3IVS	6	570	552 556	32	1205 1146
WA6LVX.	20	561	507	18	1106
W6EOT	7	557	476	39	1077
WA6OLQ	29	493 472	368	113	1003 967
W4SJH.	341	348	221	34	944
W94YK	26	432	407	38	903
W3WRE	68	416	382	32	898
W3 EML K2UCY	165	435 346	347 326	49	859 857
K7IEY	41	427	387	1	856
W9DYG	39	434	339	43	855
W4PL K2UBG		416	377	21 27	825 820
WØDUA	9	412	357	4	782
K4PQL	25	378	357	21	781
WØOHJ W7DZX	6	373 341	361	12	752 685
W9USR	4	356	220	103	683
K2GAO	200	235	210	24	669
W3VR	51	310 317	290	3 24	654
W1LDE W9CXY	10	314	293	9	649
WA2GPT	25	294	282	23	624
WA2GQI	15	314	268	20	617
K6EPT WØBES	15	292	152 254	140	599 590
KIIFJ		265	250	22	584
W4TUB	7	291	271	15	584
K6KCB	9	308 271	253 230	14	584 574
WA2CIG	49	253	241	11	554
W2EW	200	177	150	22	549
K4EHY	41	268	206	31	546

 ACC. NOT . N. COMP. CONT. P.	w r darrent					
Call	O 19.	Recd.	Ret.	Del.	Total	
W7BDU W9MAK	7	297 265	239 190	5 70	542 532	
KØWWD WA6DJB	137	158 258	192 232	34 26	521 520	
KØVPH	130	210	155	24	519	
K4DAO/4 Late Revoi VE2AZI/W1	rts:	206	190	10	506	
(July) K4ZHV (July	37	847 242	743 187	17 2	- 1644 501	
More	-Than-C	ne-Ope	rator St	ations		
Call	orta.	Recd.	Rel.	Del.	Total	
W6IAB W4LEV W9 FEM Late Repor	879	2139 276 2	2125 253 2	14 23 0	4361 1431 841	
W4LEV (Jul W4PFC (Jul	y).813	226 287	188 277	38	1265 956	
BPL for 1	90 or mor	e o total	tions-plu	s-delive	rtex	
WN4 3MC	199 W20	RZ I	30 W9Q 24 WØ8	IK	106 105	
WA2631.11	153 K3V	Web. 3 15	22 Kak	WEYER	2.03.6	

# More-Than-One-Operator Stations

K1PGQ 117

BPL medallions (see Aug. 1954 OST, p. 64) have been awarded to the following amateurs since last month's listing: WA6LVX.

The BPL is open to all amateurs in the United States, Canada, and U. S. Possessions who report to their SCM a message total of 500 or more or 100 or more originations plus deliveries for any calendar month. All messages must be handled on amateur frequencies within 48 hours of re elpt, in standard ARRL form.

specifies GMT. Was the time you entered GMT, or your local time? If the latter, did you plainly indicate what local time? Because if you didn't, we'll assume that it is GMT and will make no conversion.

2. If you used GMT, did you show the days as per GMT, or did you forget that they might be different? For example, a net meeting at 1900 CST Monday thru Friday would be meeting at 0100 GMT Tuesday thru Saturday

3. Did you enter the name of your net exactly as you wish it to appear in the net directory? In some cases, so sloppy is the entry, and so abbreviated, and containing so much extraneous material, that we can hardly believe it.

Take a look in the net listing appearing on these pages. If your registration reached us prior to the date indicated, it should be included. If after that date, it will be in the January QST list. Otherwise, something was wrong with

your data and we could not enter your net.

If this year's net directory is a "mess," as our corre spondent predicts, make sure it is not your fault and we'll

do our best to make sure it's not ours.

Remember, Nov. 1 is the tentative deadline for registration to "make" the cross-indexed net directory. If you haven't yet registered or re-registered, time's-a-wastin'.

# NET DIRECTORY

It's time for our first installment of the annual ARRL Net Directory. This month's list includes nets registered up to and including Sept. 20, 1961. Registrations received after that date will be included in the January QST listing if received prior to Nov. 15. If you have not yet registered your net for the 1961-62 season, see page 80, Sept. QST, for complete instructions.

The complete cross-indexed net directory is scheduled for distribution, as usual, on Dec. 1. We're still trying to make this deadline, and this year we hope to do it. As last year, no automatic mailing will be made. If you want a copy, you have to ask for it. A postcard or radiogram will do the job, but make it separate from other requests so we can put it in a separate folder for action when the directory comes out.

Important note: QST net listings and those in the printed Net Directory are for information only. They do not signify that these nets have any official status, do not entitle them to exclusive or prior rights to the frequency on which listed. and are in no sense a form of copyright. Insofar as possible (i.e., to the extent that we can read your henscratching and interpret your gobbledygook), net information is listed exactly as received, with certain common abbreviations used to conserve QST space. Such abbreviations will not be used in the printed net directory unless that's the way you registered it.

All net times are in GMT (Greenwich Mean Time). For conversion information, see the W1AW schedule. the week are abbreviated as follows: Dy-daily; M-Monday; T-Tuesday; W-Wednesday; Th-Thursday; F-Friday; S-Saturday; Sn-Sunday. When net operation occurs on consecutive days but not daily, the days are connected by a hyphen (e.g., M-F means the net meets each day, Monday through Friday). When net operation occurs less often than once per week, this is indicated by a numeral and slant bar (e.g., 1/Sn means the first Sunday of each month, 1/3F means the first and third Fridays of each month, etc.). Such information not capable of abbreviation, if any, is explained by footnote; see end of listing.

Okay? Here goes:

Charles . There works			
Name of Net	Freq.	GMT	Days
Adams County (Pa.) AREC Net	3865	1500	Alt/Sn
Adams County RACES C.D. Net	29,600	0100	Th
(III.)	146,250	0045	
	146,900	0045	
Akron (O.) C-D & Disaster Net	50,700	2400	M
Ala. Emerg. Net "B" (AENB)2	3575	0100	Dy
Ala. Emerg. Net "G" (AENG)	29,560	0130	Sn
Ala. Emerg. Net "H" (AENH)	29,560	1900	Sn
Ala. Emerg. Net "I" (AENI)	3885	1830	Sn
Ala. Emerg. Net "J" (AENJ)	3900	1930	Sn
Ala. Emerg. Net "L" (AENL)	3970	2000	Sn
Ala. Emerg. Net "M" (AENM)2	3965	0030	Dy
Ala. Emerg. Net "O" (AENO)2	50,550	0115	MWF
Ala. Emerg. Net "P" (AENP)2	3955	1230	M-S
Ala. Emerg. Net "R" (AENR)	50,550	0115	T-Th
Ala. Emerg. Net "8" (AENS)	3825	1930	Sn
Ala, Emerg. Net "T" (AENT)2	3965	2230	Dy
Ala. Emerg. Net "X" (AENX)	51,150	0115	T
Ala. Emerg. Net "Y" (AENY)	50,250	0200	TF
All Point Traffic Net (APTN) (Cal.)	3960	0045	Dy

•							
Name of Net	Freq.	GMT	Days	Name of Net	Freq.	GMT	Days
All Service Net (ASN)	7270	1800	Sn	Fourth Region Day Net (4RDN)	7125	1500	Dy
Antilles Emerg. Weather Net	3815	1045	Dy	Fourth Region Net (4RN)2	3547	0045	Dy
	7245					0230	
A.R.E.C. Foot Hill Region Net	28,840	0330	M	Gator Net (GN) (Fla.)2	7115	1330	Dy
(Calif.)	50,550			Genesee County Emerg. Net	29,480	0100	W
AREC Lancaster County 6	223,000	9115	11	(Mich.)	145,260	0.444	61
Meter Emerg. Net (Pa.)	50,700	2115	M	Ga. Cracker Mobile Net	3995	2200	Sn
AREC Orbitsers of Lehigh	50,560	0100	Th	(GCMN) Georgia State Net (GSN) <sup>2</sup>	3595	0000	Dy
County Net (Pa.)	00,000	0100	***	Congra State Met (CISM)	0000	0300	Dy
Arkansas CW Net (OZK)2	3790	0100	T-S	Golden Bear Amateur Radio Net	3975	0300	Dy
Ark. Emerg. Phone Net	3885	0600	M-S	Inc. (V.F.W.) (GBN) (Calif.)			
Atlanta 10 Meter Phone Net	29,600	0300	M	Goose River Net (N. Dak.)	1990	1500	Sn
Backyard Net (O.)	29,380	0100	W	Grand Co. (Ind.) C.D. Net	50,450	0200	M
Budger Emerg. Net (BEN)2	3950	24001		(N. N.)			
Baltimore County Emerg. Net (BCEN) (Md.)	28,680	01001	T	Greene County Net (Ill.)	145,400	0130	T
Berrien County Emerg. Net	29,610	1930	1 ant /9-	Gulf Coast Side Band Net	3925	1730	Dy
(BCEN) (Mich.)	50,700	1990	Last/Sn	Ham Butcher's Net (HBN) Hamilton County (Ind.) AREC	7280 50,400	1805 0100	M-F F
Betsie Bay Fish Net (Mich.)	3880	1730	Sn	Net	00,400	0100	E.
Black Diamond Emerg. Net (Pa.)	50,640	0030	Su	Hillsborough County 6 Meter	51,450	0100	Th
Bond County CD Net (Ill.)	147,060	02301		Net (Fla.)			
(BOND)				Hit and Bounce Net (HBN)	7123	2330	M-S
Boone County (Ind.) AREC Net		1800	Sn		7140	1330	Dy
	147,300			Horseshoe Radio Club Emerga	29,510	1800	Su
Buckeye (Ohio) CW Net (BN) <sup>2</sup>	3580	2400	Dy	Net (Pa.)			
Canal Zone AREC Net	7225	1430	Sn	Humboldt County Emerg. Net	3907	1920	Sn
Capital Area Radio Emerg. Net (CARE) (N. Y.)	145,350	2000	Sn	(HEN) (Iowa) Illinois CW Net (ILN) <sup>2</sup>	3515	0100	T-Sn
Central Aren Net (CAN)2	3670	0230	Dy	Indiana Sideband Net	3920	0030	Dy
Central Texas Emerg. Net	3870	1430	Sn	Ind. State Traffic Net (QIN)2	3656	0100	Dy
(CENTEXEN)				Ind. State Training Net (QIN)	3745	2400	MWF
Centre County (Pa.) AREC &	50,380	0100	Th	Inter-Mountain Net (IMN)	29,600	0200	Spec.3
RACES Net		0200	Sn	Kanawha County Emer. Net	50,250	0200	Th
Centre County (Pa.) 10 Meter	28,570	0230	M	(KCEN) (W. Va.)			
RACES Net				Kansas CW Net (QKS) <sup>2</sup>	3610	0030	Dy
Centre County (Pa.) 2 Meter	145,230	0300	M	Kansas Phone Net (KPN) <sup>2</sup>	3920	1400	Sn
RACES Net	50.400	0120	M	Kong 75 Mates Stone Wasning	2005	1245	MWF
Chattanooga Amateur Radio Emerg. Net (Tenn.)	50,400	0130	F	Kans. 75 Meter Storm Warning Net	3925	2400	M-S
Chemung Co. AREC Net	3605	0200	M	Kennehoochee Emerg. and	29,460	0230	M
(CCAREC) (N. Y.)	50,500	0230	M	Traffic Net (KET) (Ga.)	20,200	0200	
Cherokee Co. AREC Net (Iowa)	3900	1430	3/Sn	Kent County Emerg. Net	50,550	0100	T
Chicago Area Emerg. Net	1805	$0100^{1}$	Dy	(Mich.)			
(CAEN)				Kentucky CW Net (KYN)2	3600	0100	Dy
Clinton County RACES Net	146,820	2300	T	Ky. Morning Phone Net	3960	1330	M-S
(N. Y.)				(MKPN)		1430	Sn
Colo, C.W. Net (CCW) <sup>2</sup>	3652	0200	M-F	Kentucky Novice Net (KNN)	3720	2300	M-S
Conn. Nutmeg (CW) net (CW) <sup>2</sup> Conn. Phone Net (CPN) <sup>2</sup>	3640 3880	2345 2300	Dy M-S	Kings County AREC and CD	50,400	0130	TTh
Count, Phone Net (C174)-	0000	1500	Sn	6 Meter Net (N. Y.) King County AREC and CD	29,640	0200	T
Conn. Training Net (CW)	3640	1400	Sn	10 Meter Net (N. Y.)	20,010	0200	•
(CTN) <sup>2</sup>				Kings County AREC and CD	145,260	0130	T
Coos County Net (Ore.)	3917	1545	M	2 Meter Net (N. Y.)			
County Radio Assn. of Manistee	3825	2350	Th	Lake Erie Emerg. Net (Pa.)	29,150	0100	M
Net				Lancaster Emerg. Net (Pa.)	146,800	0200	M
Creek County Emerg. Net (Okla.)	3825	1230	1/Th	Long Beach C.D. High 2 Meter	147,300	0430	T
Crossroads Emerg. Net (C.Z.)	28,900	0100	W	Net (Calif.)	145 460	0245	T
Early Bird Transcontinental Net (EBTN)	3845	1000	Dy	Long Beach C.D. Low 2 Meter Net (Calif.)	145,460	0345	T
East Coast RTTY Net (ECF1)	3620	2400	W	Long Beach C.D. 10 Meter Net	29,560	0415	T
East Tennessee Net	3980	1140	M-F	(Calif.)	20,000	0110	*
Eastern Area Net (EAN)2	3670	0130	Dy	Los Alamos Emerg. Net (N. M.)	29,624	0400	Sn
Eastern Area Slow Net (EASN)	3748	2300	Dy	Louisville Area Radio Emerg.	29,500	0130	M
Eastern Canada Net (ECN) <sup>2</sup>	3540	0045	M-F	Net (Ky.)	53,600		
Eastern Mass. Phone Net	3893	2130	Dy		147,300		
Eastern Mass 2 Meter Net	145,800	2000	M-F	Nadison County Emerg. Net	50,400	0100	M
(EM2N) <sup>2</sup>	9*90	0048	D	(MCEN) (Ind.)	50 500	0990	10
Eighth Regional Net (8RN) <sup>3</sup>	3530	0045	Dy	Mahoning Valley Emerg. Net (O.)	50,500	2330	M
El Paso Ten Meter Emerg. Net	29,640	0230	T	Maine AREC Net (MEN)	3520	1300	Sn
(Texas)	20,020	0200	*	Maine Sea Gull Net <sup>2</sup>	3940	2200	M-S
Finger Lakes Net	145,350	$0200^{1}$	S	Maine Slow Speed Net (MSSN)2	3726	2230	M-F
First Region Net (1RN)2	3605	0030	Dy	Malden Emerg. Net (Mass.)	29,540	0030	M
		0230		Manchester N. H. Emerg. Net	29,000	2400	F
Five Towns AREC Net (N. Y.)	146,100	0100	M		50,400		
Fla. Amateur Sideband Traffic	3940	0000	M-F	Maritime Net	3750	2300	Dy
Net (FAST)	-	0130		Maritime Weather Net	3770	1000	M-S
Florida CW Net (QFN) <sup>2</sup>	3650	2330	Dy	Md. Del. & D. C. Net (MDD) <sup>2</sup>	3650	0015	Dy
		0300		Md-Del-DC Slow Net (MDDS) <sup>2</sup>	3650	0130	T-Sn
Fla. Phone Traffic Net (FPTN)2	3945	1200	M-S	Medford C.D. Net (Mass.)	29,520	2400	M
Fla. Slow Speed Net (QFNS)	3650	0100	Dy	Memphis Two Meter FM Net	145,500	0130	T
FMN-1 Net (Ill.)	147,500	0300	F	Miami Valley Emerg. Net (O.)	1820	0900	Sn

Name of Net	Freq.	GMT	Days	Name of Net	Freq.	GMT	Days
Miami Valley V.H.F. Net (O.)	146,520	$0200 \\ 0100^{1}$	Sn M F	Queens County Emerg. Net (N. Y.)	29,500	0030	M
Milwaukee Area RTTY Net Milwaukee 2-Meter FM Net	146,940 145,350	01151	M-F M	Richmond CD Net (Va.)	3835	1330	Sn
Minn. Section Net (MSN) <sup>2</sup>	3595	0100	Dy	Roanoke Valley AREC Net	28,800	0100	Th
Mission Trail Net (MTN)	3854	0300	Dy	(RVAREC) (Va.)	201000	0.00	
Miss. Magnolia Emerg. Net	3870	1930	Sn	RTNET (Calif.)	147,850	0400	W
Mo. Emerg. Phone Net (MEN) <sup>2</sup>	3885	2400	MWF	San Bernardino Area Net AREC	29,200	0200	T
Mo. Slow Speed Net (MSN) <sup>2</sup>	3715 3580	0200	M-F	(Calif.)	00 500	anna	1117
Missouri Traffic Net (MON) <sup>2</sup> Mich. (QMN) TFC Nets <sup>2</sup> (Fast)	3663	0100 2330	T-Sn Dy	San Diego 10 Meter AREC Net (Calif.)	29,500	0300	W
(Slow)	3000	2300	Dy	San Diego Two Meter Net (Cal.)	145.500	0300	W
Minn. S.S.B. Net	3805	1730	M-F	San Jose C.D. Net (SJCDN)	146,920	0230	T-Th
Monroe County Emerg. Net	3900	1830	8	(Cal.)			
(Fla.)				Sandhills Sunday Morning Net	3850	1000	Sn
Monroe County Emerg. Net	144,450	1300	Sn	(Nebr.)	0.077	1930	0
2Mtr Sect. (Fla.) Montgomery County (Ill.)	29,640	2000	Th Sn	Sangamon County A.R.E.C. Net and Springfield C.D. Mutual	3877	1930	Sn
A.R.E.C. Net	50,500	0030	F	Aid Area Net (Ill.)			
Montgomery County (Ill.)	145,500	0030	T	Santa Clara Operational Area	50,400	0300	W
(MCD) A.R.E.C. "The Hill-				Net (Calif.)	145,290		
toppers Net"				Sask. A.R.R.L. Phone Net	3780	0130	Dy
Muskegon County C.D. Amateur	145,000	0200	Th	Satellite Data Link Net (SDL)	3820	2300	T
Two Meter Net (Mich.) Muskegon County C.D. Net	29,610	0200	ws	Schenectady Emerg. Communi- cations Net (SEC)	3950	1900	Sn
(Mich.)	29,010	0200	WS	Schenectady Emerg. Communi-	50,640	1900	Sn
Muskegon Co. C.D. Six Mtr. Net	50,418	2100	M-Th	cations Six Meter Net (SEC-6)	00,010	2000	6,743
Nassau County 10 Meter Net	28,720	0100	T	Second Regional Net (2RN)2	3690	00451	Dy
	28,680					02301	
Nebraska CW Net (NEB) <sup>2</sup>	3525	0100	Dy	The Seward County C.D. Net	3830	0100	Dy
Nebr. Post Office Net Nebr. 75 Meter Emerg. Fone	3980 3983	0015 1830	T-Sn	Seymout Amateur Radio Club	50,400	2400	1/Sn
Net <sup>2</sup>	9999	1990	Dy	Net Shawnee Amateur Radio Assn.	147,300 3875	1400	Sn
Nebr. 75 Meter Fone Net <sup>2</sup>	3980	1330	Dy	Net	0010	1400	13th
Nevada County AREC Net	3890	1330	Sn	Show-Me Net (CW) (SMN)	3580	2200	Sn
(Ark.)	9009	14001	CI.	(Mo.) <sup>2</sup>	*** 000	0000	Ct 1977
N. J. C.D. Net (Phone) (CDNJ) N. J. Emerg. Phone & Traffic	3993 3900	1430 <sup>1</sup> 1400 <sup>1</sup>	Sn Sn	Sioux Falls Emerg. Net (S. Dak.) 6 Meter Crossband Traffic Net	144,900 50,850	0300	SnW T-S
Net <sup>2</sup> (NJPN)	93900	23001	M-S	Socal 6 Net (Calif.)2	50,400	0330	Dy
New Jersey Net (NJN)2	3695	2400	Dy	South Bay C.D. Net (Calif.)	146,990	6300	T
NJ6-2 Emerg. and Tfc. Net	51,150	0300	MThSn	South Carolina Net (SCN)2	3795	2400	Dy
	146,700	2200	TS			0300	
N.Y.CL.I. Phone Net	3908	2230	M-S	S. C. Emergency Net (SCEN)	3930	0030	T-S
(NYCLIPN) <sup>2</sup> N.Y.CL.I. VHF Traffic Net	145,800	0100	TWTh	South Dakota CW Net (SDN)2	3645	2030 0100	Sn TTb8
New York State Net (NYS)2	3615	2400	Dy	S. D. Nine, Jacks & Queen	3870	1815	M-S
N. Y. State Phone Traffic &	3925	2200	Dy	(noon) am-phone net (NJQ)			
Emerg. Net (NYSPTEN)	-			S. D. 75-meter (eve) Emergency	3870	0030	Dy
Newport County Emerg. Net	29,530	15001	Sn	AM-phone Net	TO 100	0000	**
(NCEN) (R. I.) Newton (Mass.) C.D. Net	53,745	0200	M	Southeastern Ind. 6 Meter Net Southeastern Wis. 2-Meter	50,400 145,650	$0200 \\ 0200 $ 1	M M
Ninth Regional Net (9RN)2	3640	2330	Dy	Emerg. Net	140,000	0200-	M
		0200		Southern Calif. Net (SCN)2	3600	0300	Dy
No Name Phone Net	7255	1300	Dy	Southern Peninsula Emerg.	146,000	0345	T
North Carolina CW Net (NCN)	3547	2330	Dy	Comms. Service Net (Calif.)		2000	~
North East Texas Emerg. Fone Net (NETEN)	3970	1400	Sn	Southwest La. Emerg. Net	3850	2000 0100	Sn
North Texas CW Traffic Net	3770	0100	Dy	St. Clair County Emerg. Net (Mich.)	29,590	0100	T
(NTX) <sup>2</sup>		0400	-3	St. Law. County AREC Net	3875	1200	1/Sn
North Texas Traffic Net	3960	2330	Dy	(N. Y.)			
(NTTN)2				Steuben County AREC FM Net	52,525	2315	Th
Northern Calif. Net (NCN) <sup>2</sup>	3635	0300	Dy	(Ind.)	-0 -00	0100	T3
Northwest Slow Speed Net (NSN)	3700	$0500^{1}$	T-8n	Suncoast 6 Meter Net, St. Petersburg Fla.	50,700	0100	F
Novice Traffic Net (NTN)	3745	00301	FSSn	Tennessee CW Net (TN)2	3635	0100	T-Sn
NYC-LI CW Net (NLI)2	3630	0245	Dy	Tri-Cities Net	29,000	0200	Dy
		0030	M-F	Tri-County Emerg. Net	28,900	0200	Th
		0015	SSn	Tri-State Traffic and Emerg. Net	29,100	0200	TTh
Oak Ridge (Tenn.) Emerg. Net	50,700	2400	M-F	Trumbull County Emerg. Net	29,604	2045	T
Ohio Novice Net (ONN) Ohio Phone Net (OPN) <sup>2</sup>	3710 3860	2300	M-F M-F	(O.) Turlock ARC Alt. Tues. Nite	145,350	0100	Ale Cr
Ohio Slow Net (OSN) <sup>2</sup>	3580	2330	Dy	Net (Calif.)	1.40,000	3100	2416/-1
Okla. Phone Emerg. Net (OPEN)	3860	1400	Sn	20 Meter Interstate S.S.B. Net	14,275	1500	M-F
Ontario Fone Net (OFN)	3770	2400	M-S	Twin City Emerg. Net (Chain-	28,560		Th
Ontario-Quebec Net <sup>2</sup>	3535	2400	Dy	paign-Urbana, Ill.)			~
Oregon AREC Net	3875	0300	M-F	Union County 6 Meter A.R.E.C.	50,550	1530	S
Ore. Emerg. Network (OEN) Oregon Post Office Net	3840 3820	1000	Dy W	Net (N. J.) Upper Peninsula Emerg. Net	3920	1400	Sn
Oregon State Net (OSN) <sup>2</sup>	3585	0230	T-S	V.F.W.'s Golden Bear Amateur	146,570		Dy
Panhandle Weather Net	3940	2330	Dy	Traffic Net, Inc. (GBN-2)			23
		2400	M-F	(Calif.)			
Pine Tree Net (Me.)2	3596	2400	TAT . T.				
Pine Tree Net (Me.) <sup>2</sup> Porter County Emerg. Net (Ind.)	145,800	0030	T	Virginia Net (VN) <sup>2</sup>	3680	2400	Dy
Pine Tree Net (Me.)2			T		3680 3835 3935	2400 2400 0200	Dy Dy Dy

Name of Net	Freq.	GMT	Days	Name of Net	Preq.	GMT	Days
Virginia Slowspeed Net (VSN) <sup>2</sup>	3680	2330	M-8	Winthrop Emerg. Net (Mass.)	147,500	2330	2/M
Waltham CD Net (Mass.)	146,800	0030	M	Wisconsin Intrastate Net (WIN)2	3535	0115	Dy
Wash, and Nowata Counties Emerg. Net (Okla.)	3815	1930	Sn	Wisconsin Races Net	3505.5 3993	1500 <sup>1</sup> 1400 <sup>1</sup>	Sn Sn
Washington Section Net (WSN)2	3535	0300	T-8	Wisconsin S.S.B. Net <sup>2</sup>	3985	2400	Dy
Wayne County RACES Not, Zone 10-12 (Mich.)	28,710	0130	Th	Wis. Slow Speed Net (WSSN) <sup>2</sup>	3535	0030 2400	M-F Dv
West Mass Slow Speed Net (WMSN) <sup>2</sup>	3560	2330	TTh8n	Wolverine (S.S.B.) Net Wood-Ridge, N. J. C-D Net WVN (W. Va. CW Net)	3930 145,680 3570	2400 2400 0000	W T-Sn
West Phila, Radio Assn. Net	29,360	1500	Sn	WYO CD Net	3537.5	0200	W
Western Boomers Net (Okla.)	3860	1215	M-S	Wyoming Civil Defense Net	3920	0300	Dy
Western Mass. Net (WMN) <sup>3</sup>	3560	2100	M-8	YO Net (Wyo.)2	3610	0130	TTh8
Western Penna. Traffic Net (ORS) <sup>2</sup>	3585	2400	M-F	Net operates one hour earlier light saving."	when loc	al time	is "day
Westpark Radiops Emerg. Net	29,520	0130	T	<sup>2</sup> Part of ARRL National Traffic System, Ask for CD-24			
	51,150	2300	M	for full information.			
Winchester CD RACES Net (Mass.)	147,100	0045	W	<sup>3</sup> Net meets 10th, 20th and 30 EST.	th of the	month	at 2100

	D	X CENTURY	CLUB AWARI	s	
	HONOR ROLL		WØAIH/VE3	VK5QR192 W9ΓKD191	KA5BU 143 ZL1ARY 143
PY2CK 314 W3JNN 313 W8JIN 313 W6AM 312 W6CUQ 312 W9NDA 312 KV4AA 312 W1GKK 312 W9RBI 312 W9RBI 312 W2AGW 312	W9YFV 311 W7GUV 310 W2HUQ 310 W3KT 310 W1ME 309 W8BF 309 W6EBG 309 W8 DMD 308 W5ADZ 308 W7GBW 308	CE3AG 307 W2dXA 307 W8UAS 307 LU6DJX 306 W6QVZ 306 W6ENV 306 W4 IM 305 WJELA 305 ZLIHY 305 W8KIA 305 W2LPE 305 W3BES 305	DLIIN 236 W4EJ 234 W9FIO 232 W9IJW 232 W9IJW 231 W100A 230 W20BX 230 G3A1Z 230 W4HVQ 229 YU1AG 224 W8LLG 224	SM5AJU 191 Z86A 191 W1WAI 190 K2HIY 190 W9PVA 186 DJIVS 186 K9CUY 182 G2YS 182 K6CAE 181 W2EOH 180 K21FV 180	W1QV 142 KH6BTX 141 K8MTI 141 KW8DG 141 K2QIL 140 VE2AFV 140 F87RT 139 K6JC 136 W1MD 132 K8OJH 132
W3GHD311 W88RA311	W5ASG307	W3BES305 W7PHO305	W8LY	VE7EH 180 DJ3BB 176 SP4JF 174	ZS5KU 132 K2UVV 131 W2MES 130 W6ISQ 139
	Radiotelephone		W1VAN 220	W2WMG173	KW6DF130 SP9TA130
PY2CK 314 W8GZ 309 W8BF 308 W9RBI 307	VQ4ERR. 305 W3JNN. 305 W8KML. 304 W8PQQ. 303 W7PHO. 303	4X4DK301 CX2CO300 W6YY300 W4DQH299	W4CKB 220 KH6BLX 220 K91YW 220 W9JIP 220 W8JJM 218 KØRAL 214 W5ARJ 212	K8BOD 172 K2PFC 171 K4FEA 171 DJ4TZ 171 W8HEV 170 G3KZI 170	K4 FKM 128 W2 HUG 125 K6 BTU 125 K4 MM X 124 K6 ZIF 124 W6 ZSS 124
and endorsements more countries hav	to September 1, 1961 based on postwar cor e been issued by the A o the amateurs listed	RRL Communica-	K2ZKU. 211 W4RNP 210 K68XA. 210 V 51WL. 205 K4RPK 204 W8 6LL 204	K4CIA 167 W6GRX 167 K4JEY 166 WØIFW 166 W8QZA 164 W6JKJ 162	K9UHH 124 K4MWB 121 W7NNF 121 W1EHT 120 W8CUT 120 G3GMY 120
	NEW MEMBERS		W4CVR 201	OZ7KV 155	PAØNIR
HB9TL 251 W4VZB 204 K4AJ 153 SP9KAD 151 W7GDS 143 OK3OM 138 OH3 rQ 136 SP6BZ 136	GC3LXK 106 8M55HF 106 W2FGZ 105 JAØAQ 105 W4BVQ 104 W8PEI 104 K2PNF 103 W9ACU 103 K90JJ 103	OK1MX 101 K1MOD 100 K2HOE 100 K2UAR 100 K3AUΓ 100 K4DFO 100 W4ZFJ 100 W6βPR 100	W3IPO 200 W4BFR 200 W7ABO 200 K8KAE 200 SP7HX 200 ZP5LS 200 W41F 196 SP8CK 192	SPSAG 155 W4HUE 152 W3ZHQ 150 K5JCC 150 W8KOD 150 G3LVC 148 HH2LD 144	W5LJT 115 W9UTQ 111 K1IGO 110 WA2HUV 110 K3CUI 110 W4DSJ 110 K8ANX 110 SM5AIO 110
G31ZJ 131 K4LNA 130	DL6DF103	W6FAY100 K6LQA100		Radiotelephone	
K2GKM 125 SP5ADZ 119 K4 rWF 116 SP8HT 116 W2FXC 109 DL6QW 109 UGVV 108 VE3CYL 107 FB8CE 107	W7QY. 102 DL6BS. 102 SVØWZ. 102 K5MWH. 101 K5VJT. 101 K6YCB. 101 K8PUU. 101 OK1ABE. 101	K6ROU 100 W7UZE 100 K81PS 100 K81WC 100 W8KNK 100 K9RZV 100 DL7HC 100 HA7PZ 100 UA2AO 100	W2ZX 290 T12HP 277 W7HIA 276 ON4DM 276 W3KT 272 W3GHD 271 PY4KL 262 G3DO 260 S 45LL 249 EA2CA 242	W5ERY 211 W3BES 210 W9BEK 205 W0M LY 205 K5MDX 202 W0QGI 272 W9PQA 201 W4TDW 200 K8RTW 200 V810 192	VE1WL 162 WøJWL 162 YU1AG 149 DJ3CP 147 SP8CK 147 I1AM 146 K2TAP 140 K9LTN 140 K6RAL 140 K6COM 137
	Radiotelephone		TG9AD241	HB9FE191	FS7RT 135
K4HEF 204 K4AJ 152 G3LVC 141 EA8CM 128 W4VZB 127 W1HR 124 DL6EQ 123	G3KKJ 123 W4HNW 120 W4JFE 115 SP5XM 113 PAØUC 110 HZ1TA 107 K5AWR 104	W7GDS 104 OD5CC 104 WØEXU 103 DJ30J 103 DL4VQ 103 W8VAC 101 K8PUU 100	LATY 234 W4PDL 226 G13IVJ 225 W4FFB 223 MP4BBW 223 W1GOU 222 W3MAC 222	KØCTL 190 IICQD 190 DL3DW 189 W4VYP 188 WAZIZS 185 PAØZD 181 WILHZ 181 WØAIH/	W#VBQ 129 W#SGMF 129 ZL3IE 124 VK5QR 124 SP9RF 121
	ENDORSEMENTS	3	W1JYH220 W1GKK 220	VE3176 EAZEM 171	CE3WN 120 W9PVA 120
W5MMK 304 W8LKH 301 W2TQC 300 W6DZZ 300 W7AMX 300 W7ENW 300	W2SAW 282 LA7Y 282 W4EPA 281 W6CHV 280 K6CQM 280 W6UHA 280	W5HJA260 W5LGG260 W6IBD260 W4VYP259 W1WDD257 Y810257	K2MGE 214 W1WDD 213 DLIIN 213 W3CGS 211	K2JFV 170 W9ZSZ 170 W3QMG 163	K4MMX 114 W9GAL 112 KØGZN 111
W9K0K 300 WØDU 300	W7HIA280	G131V.I 256		Area and Contine	
G6ZO 300 W7AC 297 DJ1BZ 295 W6LDD 292 SM5LL 292	PAØFX 274 W1HA 272 WØM LY 272 K2LWR 271 W8NGO 271	W3LMO 252 W4 ΓFB 252 PAØ ΓAU 249 K4HNA 248 W8 CCQ 245 KZ5WZ 243	KH6CD 261 KL7PI 261 VE1PQ 260 VO1DX 255 VE2WW 290	VE3DIF 284 VE4XO 200 VE5RU 220 VE6NX 256	VE7ZM
W2D8290 W5OLG290	W5AWT264	TG9AD 241		Radiotelephone	
W6QNA 290 W8KPL 290 G3FKM 288 W3CGS 286 W2CNT 285 W5UX 285	W5HDS 264 K4AIM 263 WA2IZS 261 W2MUM 260 K2UVU 260 K5BGB 260	W1LHZ	W1FH289 W2BXA291 W5BGP265 KH6OR261 KL7AFR190	WØAIW 291 VE1PQ 166 VO1DX 141 VE2WW 240 VE3QA 241 VE4RP 102	VE5RU 20: VE6TF 19: VE7ZM 28: EA2CQ 28: ZL1HY 29:

# NATIONAL CALLING AND EMERGENCY FREQUENCIES (KC.)

3550	3875	7100	7250
14,050	14,225	21,050	21,400
28,100	29,640	50.550	145,350

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. - 3535, 7050, 14,060; phone - 3765, 14,160, 28,250 kc.

# SUGGESTED RTTY **OPERATING FREQUENCIES**

3620, 7040, 14,090, 21,090 kc.

## **GMT CONVERSION**

To convert to local times subtract the following hours: ADST -3, AST -4, EDST -4, EST -5, CDST -5, CST -6, MDST -6, MST -7, PDST -7 PST -8, Honolulu -10, Central Alaska -10.

# CODE PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from W1AW will be made Nov. 17 at 0230 GMT. Identical tests will be sent simultaneously by automatic transmitters on 3555, 7080, 14,100, 21,075, 28,080, 50,900 and 145,800 kc. The next qualifying run from W6OWP only will be transmitted Nov. 3 at 0500 Greenwich Mean Time on 3590 and 7129 kc. CAUTION: Note that since the dates are given per Greenwich Mean Time, Code Proficiency Qualifying Runs in the United States and Canada actually fall on the evening previous to the date given Example: In converting, 0230 GMT Nov. 17 becomes 2130 EST Nov. 16.

Any person can apply. Neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m. you may try later for endorsement stickers.

WlAW conducts code practice daily at 0230 GMT on all frequencies listed above with speeds of 15, 20, 25, 30, and 35 w.p.m. on Tuesday, Thursday, and Saturday, and at 5, 71/2, 10, and 13 w.p.m. other days. Approximately 10 minutes' practice is given at each speed. To check your copy, the texts used on several transmissions are listed below. The order of words in each line of QST text is sometimes reversed. To improve your fist, try to send in step with W1AW. Subject of Practice Text from Sept. QST Date

Nov. 3: Handling OSCAR Reports . . . , p. 18 Nov. 7: High-Power . . . Linear, p. 11 Nov. 10: Fixed or Portable . . . p. 20

Nov. 15: A. M. with Collins S.S.B. Units, p. 26

Nov. 18: A Complete Two-Band Station . . . , p. 32 Nov. 22: A Utility Power Supply . . . , p. 38

Nov. 24: The Big Wheel on Two, p. 42

# WIAW SCHEDULES

(November 1961)

# Operating-Visiting Hours

Monday through Friday: 3 P.M.-3 A.M. EST.

Saturday: 7 P.M.-2.30 A.M. EST. Sunday: 3 P.M.-10.30 P.M. EST.

The ARRL Maxim Memorial Station welcomes visitors. The station address is 225 Main St., Newington, Conn., about 4 miles south of West Hartford. A map showing local street detail will be sent on request. The station will be closed Nov. 23, Thanksgiving Day.

#### Operating Frequencies

C.w.: 1820, 3555, 7080, 14,100, 21,075, 28,080, 50,700, 145,800

Voice: 1820, 3945, 7255, 14,280 (s.s.b.), 21,330, 29,000 50,700, 145,800

Frequencies may vary slightly from round figures given: they are to assist in finding the W1AW signal, not for exact calibrating purposes.

## Official Bulletins

Bulletins containing latest information on matters of general amateur interest are transmitted on the above frequencies according to the following schedule in Greenwich Mean Time

C.w.: Monday through Saturday, 0100; Tuesday through Sunday, 0500.

Voice: Monday through Saturday, 0200; Tuesday through Sunday, 0430.

Caution: Note that in the U.S. and Canada, because times are GMT, bulletin hours actually fall on the evening of the previous day.

# WIAW CONTACT SCHEDULE

Would you like to work W1AW? W1AW welcomes calls from any amateur station in accordance with the following schedule:

GMT	Sunday	Monday	T sesday	Wednesday	Thursday	Friday	Saturday
0030-0100			7255		7080		7255
0120-02001		******	708	3555	$7080^{2}$	$3555^{2}$	7080
0210-02301			3945	50.7 Mc.	145.8 Me.	3945	3945
0330-0430			3555	3945	7080	1820	3555
0440-05001			3945	14,280	3945	14,280	3945
0520-06001		*****	$3555^{2}$	7255	3555	70802	3945
0600-0710	*****		14,280	14,100	3555	14,100	
0700-0800			7255	3945	7080	3945	7255
2000-2100			11,280	21/28 Me.3	14,100		******
2100-2200		14,280	21/28 Me.3	14,100	21/28 Mc.3	21,330	
2200-2300		14,100	14,280	$21,075^2$	14,280	14,100	******

General-contact period on stated frequency begins immediately following transmission of Official Bulletin

which begins at 0200 and 0430 on phone and at 0100 and 0500 on c.w. Starting time is approximate.

<sup>2</sup> W1AW will first listen for Novices before checking the rest of the band for other contacts.

<sup>3</sup> Operation will be conducted on either 21,075, 21,330, 28,080 or 29,000 kc.

· All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio Club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

### ATLANTIC DIVISION

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, Allen R. Breiner, W3ZRQ—SEC: DUI. PAM: IVS. RM: EML. EML. succeeds AXA as our new Route Manager. Van retires with a record a yard long as traffic-handler and trainer of new c.w. traffic men. Our new RM takes over with a wonderful background, K4LPR has transferred to E.Pa. from Virginia and is OPS and OO. K3NLX is a new OES. New Genr and Awards Dept.: To K3JLW, the Keystone Award No. 124; a 6146 linear amplifier for 6 meters to K3DSM, who now has 28 countries and 50 states confirmed; a Public Service Award for hurricane traffic-handling to UUL. A new member of the PFN Net is K3KIZ. BPZ has a new YL harmonic. New Novice operators in the Susquehanna Valley are PSL, QHL, QEN, QIJ, PXU and QIC. The SYARC has had its club call, VPJ, reissued. New General Class licensees are QFY, NFU and NGH. Mort, a blind protégé of BUR, has received his Novice Class ticket with the call KN3QPS. BUR celebrated his 25th wedding anniversary. K3HTZ changed his keying system in the DX-40 for better reports on 49-10 meters. K3MVO is now using an inverted "V" antenna at the new QTH. K3BHU, W3DGX and company, "EL Professional Freeloaders, ESq.," spent a few days at the Oney Bull State Park. EU has completed the haymaking season and now is in the process of building a new operating shack. The Laneaster Radio Transmitting Society started code classes Sept. 15. K3HEC is on 2-meter s.s.b. W3SAO and company were coal-region vacationers and camped their portable "Tee-Pee" on the lawn of your SCM. BNR again is on the bands at the new QTH, P. O. 222, Hinkley, Calif. The Schuylkill County ARC meets at the Pottsville City Hall the 2nd Tue. of each month. K3CNN received the "Hunt the Hunters Certificate." (CUL is looking forward to a busy fall traffic season. Either hams are getting more careless or NOH is doing more Oo monitoring. YLL, one of our top Oo, will change his QTH and section to Southern New Jersey. HNK wants all E.Pa. readers to be extended. "A Very Merry Christmas." A bit carly, eh' Happy Thank

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Thomas B. Hedges, W3BKE—Asst. SCM Delaware: M. F. Nelson, K3GKF, SEC: CVE. MDD Draffic Net meets at 1915 EST and MDDS (slow) Net 2030 EST, both on 3650 kc.; MEPN (phone) at 1800 EST and week ends at 1300 EST on 3820 kc.; MDD AREC Nets Tue. at 2100 EST on 3821 and 7042 kc., also 50.7 and 145.660 Mc. August appointments: EEB as ORS and WQR as EC for Susex Co., Del. AYD likes his new Invader-2000 and is sporting a "250" sticker for his DXCC. BUD says his Mohawk receiver is FB. K3BYJ has named DJP as Asst. EC for New Castle Co., Del. CDQ had a nice visit with the Denver RC on her western trip. Best of luck to K3CRF, who has left So. Del. for preps school. VE3DYK/W3 is now back to full time on MDD. EEB has three telephone poles in the yard of his new house. EOV has blisters to prove he built an 3-X-12-ft. shed for his 3-kw. emergency generator. 4EXM/3 says that KR6AM is now on s.s.b. only. K3GJB is doing fine as EC for Montgomery Co. GQF, with WZL as operator, is keeping a regular traffic sked with KC4USV. K3GZK has his HT-37 working FB on 20 meters. The Foundation for AR is laying big plans for a bang-up Atlantic Division Convention in 1963.

HQE is busy keeping ekeds with military bases. IVC turns in a nice traffic count from Port Deposit. New Washington RC officers are KN3IPY, pres.; CPM. vieepres.; CDQ and AKB. secys; and K3NNG treas. K3IZM has a new scope. K3JDN has joined the Air Force and will be out of section activities for awhile. JSL is now operating from Camp Winslow, Md. K3JVB has a new Snawnee and will be concentrating on 6 meters for a spell. K3JYZ makes BPL again and reports his son K6ULV is now home. KHA is keeping up his OBS skeds. K3KHK used his 15-watt rig on his recent trip to the Bahamas. K3KPZ is back on winter OBS skeds. FTD is keeping regular skeds between Baltimore and Guam. KQS spent the summer teaching radio at a camp on Lake George. KTR is moving to Florida where he will sign 4YSO. K3LFD turned in an FB traffic count. K3LJB reports he and K3FUI are building a 3-band quad. Congrats to K3LWD on passing the General Class exam. MCG is looking for leadership stations to help in MDD. GRF is going to matched feed on all beams. K3MDL has loaned his receiver to K33NFJ. K3MQP is a new reporter from Adelphi, Md. MSR had a nice vacation in VE3-Land with his 2-meter mobile. K3MXJ checks in from Delaware. K3MZY has a new tower up 60 ft. FCC Acting Chairman Bartley presented the first Gore Memorial Scholarship to K3NKX/W0BPO. NQC is organizing a Baltimore AREC RTTY net. K3OGA received his 15-w.p.m. sticker. OHI is active on MEPN. KN3ONQ passed his General Class exam. TN maintains steady traffic activity. UE is now mixing civic affairs with his traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affairs with is traffic activity. UE is now mixing civic affai

SOUTHERN NEW JERSEY—SCM. Herbert C. Brooks, K2BG—SEC: K2ARY, RMs: W2BZJ, W2ZI and W2BLDE Sc, KN3FEJ 12, K3GJB 11.

SOUTHERN NEW JERSEY—SCM. Herbert C. Brooks, K2BG—SEC: K2ARY, RMs: W2BZJ, W2ZI and W2BLDW. W24BLD, Paulsboro, operated portable from W1- and W3-Land this past summer. Ex-K1CIP, now W42VAT, Audubom, is quite active on NJN. The N. J. Phone & Yic, Net held its 6th Annual Pienic at Browns Mills with 40 members and families attending. The net's August totals: 31 sessions, 667 QNI and 248 traffic. W42QDD is a new General Class operator in Trenton. W42KWB has worked W4C and also made 230 Q8Os in the N. J. Q8O Party. The Cumberland Radio Club has been assigned the call W2BX. W2JAV, Hammonton, has made W4S and W4C on RTTY. K2YBN will teach a code and theory class for the Levittown (N.J.) Radio Club this fall. The Gloucester County ARC was congratulated by officials of Lake Garrison for its radio work during the Lake Garrison Water Carnival. Those taking part were W2CKX, W2LVW, W2RVQ and W3FFG. The SJRA's Q8O Party winners were W42BLV. K2BZK, K3JNP, K28HJ, W42GJE and W42KWO. W42WKO and W42BUO received the SJRA certificate for working 50 members. The Burlington County Radio Club is planning many interesting programs. The meeting night is least the 1st. Fri. of the month. This club received the League's Public Service Award for its activities during Hurricane Donna. R2HJY, Medford, replaces W2WKI as Burlington Co. Radio Officer. K2ARY, SEC. is planning a meeting of the ECs in the section. Your SCM enjoyed a visit to the Southern Counties ARA meeting. K2HBA is president. K2SOX received the Armed Forces Day certificate. K2CIR has a new beam for 2 meters. The SCARA meets the 2nd Fri. in Northfield. All emergency-powered equipment should be checked so as to perform efficiently if needed. All appointees are urged to report activities the first week of each month. Traffic: W2RG 170, K2RXB 78, K2SOX 66, W2BZJ 64, W4ZHJD, 54, W4ZYJ 78, W2ZI 36, W4ZKWB 20, W4ZHWB 20, W4ZHWB 20, W4ZHWB 20, W4ZHWB 20, W4ZHWB 20, W4ZHWB 20

WESTERN NEW YORK—SCM, Charles T. Hansen, K2HUK—SEC: W2LXE. RMs: W2RUF, W2EZB and W2FEB. PAM: W2PVI. NYS C.W. meets on 3615 kc. at 1900, ESS on 3590 kc. at 1800, NYSPTEN on 3925 kc. at 1800, NYS C.D. on 3510.5 and 3993 kc. (s.s.b.) at 0900 Sun., TCPN 2nd call area on 3970 kc. at 1900, IPN on (Continued on page 114)

### "TVI TODAY"

he big bad monster of a few years ago has just about left the ham radio scene. TVI, once a word that caused switches to be pulled, doors to be locked, and the family evacuated until the storm on the local front was over, has now been placed in the dangers from the past.

o be sure, the spector of TVI appears once in a while to haunt the unwary; but, by and large, the danger today has been minimized. Through the years, the Chicago Area Radio Club Council has found the problem of TVI can best be solved by using TVI committees formed by each of the member clubs in the Council.

o be sure, most hams at one time or another have, or will, run into the individual who does not want to listen to the facts in the case. He just wants the station put off the air as the best way to solve the difficulty.

It has been found through experience that a third person, to take an impartial viewpoint in the discussion, is in a better position to get the situation solved without causing a neighborhood uproar. Always remember that the approach to be used by the Third Person is, "I understand that you are having an interference problem, and I am here TO HELP YOU."

Wost cases of TVI these days center about two basic causes: One, the usual case of TV receiver front end overloading is cured by the application of a high pass filter AT THE INPUT TERMINALS OF THE SET in question. The other is caused by the broadness of the TV receiver front end. This is evident in areas where Channel Two is present and six meter activity is high.

On cases investigated by the CARCC (Chicago Area Radio Club Council\*) in recent years, the use of the 52 mc cutoff high pass filter took care of the majority of cases brought to light either from low frequency operation or VHF. The balance of the cases were cleared by use of stubs and traps. A list of TV set manufacturers offering high pass filters is most helpful in advising the public of what they can do to help themselves in this position.

station TVI check list should include: grounds, both earth and equipment; proper adjustment of transmitter; use of low pass filters; bonding of all shields; monitor scope for checking of emitted signals to prevent splatter, key clicks, etc.

he advent of SSB has helped to a great degree to reduce the number of TVI complaints in the last few years. However, the problem is still with us. With high fidelity, stereo, and the wide open audio stages in some of these sets, a tight knit interference committee is needed in each club to attack the problem from an area standpoint.

JORDAN KAPLAN, W9OKE President, CARCC

\* The Council is composed of delegates from all leading Chicago Area Radio Clubs.

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RANGER II—Now—a new version of the popular 75 watt CW or 65 watt AM "Ranger". The "Ranger II" transmitter also serves as an RF/audio exciter for high power equipment. Completely self-contained instant bandswitching 160 through 6 meters! Operates by built-in VFO or crystal control. High gain audio-timed sequence keying, TVI suppressed. Pi-network antenna load matching from 50 to 500 ohms. With tubes, less crystals.

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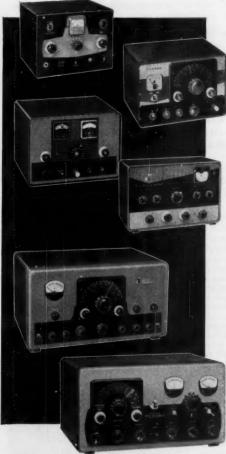
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NAVIGATOR—40 watts CW input . . . also serves as a flexible VFO exciter. 6146 final amplifier tube—bandswitching 160 through 10 meters. Built-in VFO or crystal control. With tubes, less crystals.

Cat. No. 240-126-1 Kit-Amateur Net . . Cat. No. 240-126-2 Wired and tested—Amateur Net . . . .

CHALLENGER—70 watts phone input 80 through 6: 120 watts CW input 80 through 10 . . . 85 watts CW on 6 meters. Two 6DQ6A final amplifier tubes. Crystal or external VFO control—TVI suppressed—wide range pi-network output. With tubes, less crystals.

Cat. No. 240-182-1 Kit-Amateur Net . . Cat. No. 240-182-2 Wired and tested-Amateur Net . . . \$154.75

6N2—Rated 150 watts CW and 100 watts phone— offers instant bandswitching coverage of both 6 and 2 meters. Fully TVI suppressed—may be used with "Viking I, II", "Ranger I, II", "Valiant" or similar power supply/modulator combinations. Operates by crystal control or external VFO with 8-9 mc. output. With tubes, less crystals.

Cat. No. 240-201-1 Kit-Amateur Net . . \$129.50 Cat. No. 240-201-2 Wired and tested - Amateur Net . . . \$169.50

VALIANT—275 watts input CW and SSB (P.E.P. with auxiliary SSB exciter) 200 watts phone. Instant band-switching 160 through 10 meters—built-in VFO or crystal control. Pi-network output matches antenna loads from 50 to 600 ohms. TVI suppressed—timed sequence keying—built-in low pass audio filter—self-contained power supplies. With tubes, less crystals.

Cat. No. 240-104-1 Kit-Amateur Net . . \$349.50 Cat. No. 240-104-2 Wired and tested—Amateur Net . . . \$439.50

FIVE HUNDRED—Full 600 watts CW—500 watts phone and SSB (P.E.P. with auxiliary SSB exciter). Compact RF unit designed for desk-top operation. All exciter stages ganged to VFO tuning—may also be operated by crystal control. Instant bandswitching 80 through 10 meters—TVI suppressed—high gain push-to-talk audio system. Wide range pi-network output. With tubes, less crystals.

Cat. No. 240-500-1 Kit-Amateur Net . . \$749.50 Cat. No. 240-500-2 Wired and tested -Amateur Net . . .

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Kit HX-11... NO MONEY DOWN, \$5 mo...

An excellent transmitter for the novice or CW amateur who appreciates a clean, quality signal and real distance getting power! Features 50 watt RF power input on 80 through 10 meters, built-in low pass filter, single-knob bandswitching, switched antenna relay power and pi-network output coupling for complete operating convenience. A "tune-operate" switch allows off-the-air tuning and a large "clear view" meter indicates final grid or plate current. Easy access to crystal socket is provided by a metal pull-out cabinet plug. Power supply is built-in. Careful design and high-quality components used throughout make this kit easy to assemble and assures long, reliable and trouble-free performance for years to come. An outstanding "watts-per-dollar" value in amateur gear. 17 lbs.

### The DX-60 Surpasses Quality and Performance of Transmitters Costing Far More!

This outstanding phone and cw transmitter offers far more in quality and performance than any other unit in its price and power class! A front panel switch selects any of four crystal positions or external VFO. Controlled carrier modulator and silicon diode power supply are built in. Single knob bandswitching for 80 through 10 meters and pi-network output coupling provide complete operating convenience. Panel meter shows final grid or plate current for easy tuning. Assembly is a marvel of simplicity with clean, rugged construction and thoughtful circuit layout. A precut, cabled wiring harness eliminates tedious wiring and the informative instructions furnished make it an ideal kit for the novice. May be run at reduced power for novice operation. Less crystals. 25 lbs.

Kit DX-60...NO MONEY DOWN, \$9 mo.......\$82.95





### New low cost, broad coverage Heathkit VFO HG-10

Covers 80 through 2 meters with each band separately calibrated on a rotating drum-type slide-rule dial. Uses a series tuned Clapp oscillator with regulated plate voltage for stability and a cathode-follower output stage for load isolation. Features 28:1 vernier gear drive, and "spotting" switch for off-the-air tuning. Powered by transmitter. Styled like the Heathkit DX-60 and plugs into it directly. Easy to build. 12 lbs.

Kit HG-10...NO MONEY DOWN, \$5 mo.......\$34.95



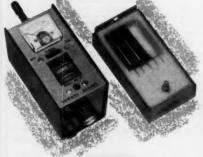
### Improve your receiver performance with this new Heathkit "Q" MULTIPLIER

May be used with any receiver having an IF frequency between 450 and 460 kc. This "electronic filter," with effective "Q" of approximately 4,000, provides either a sharply-peaked IF curve for CW, a broad peaked IF curve for AM or SSB, or a deep sharp notch for rejecting heterodynes on CW, AM and SSB. Both peak or notch positions are tunable to any point in the receiver's IF bandpass. Ideal for CW reception and heterodyne rejection on receivers or transceivers employing fixed bandwidth mechanical filters such as the Collins 75S-1. Power supply is built-in. 2 lbs.

Kit HD-11.....\$14.95







### New!... nothing else like it anywhere... the Heathkit "TUNNEL-DIPPER"... exclusive tunnel-diode oscillator!

First of its type! Performs like a "grid-dip" meter but uses a tunnel-diode oscillator and transistors—no tubes! Built-in battery supply for complete portability . . . use it anywhere for alignment, trouble-shooting, etc. Features color-matched coils and dial scales for easy reading; printed circuit board for easy assembly. Protective cover has storage space for coils. Enclosed vernierdriven drum-type tuning dial prevents accidental change in settings. 3 lbs.

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### IS K6INI THE WORLD'S CHAMPION DX OPERATOR?

Judge for yourself! Read his letter and count the DX he has workedwith only 65 watts and a \$16.95 Gotham V-80 Vertical Antenna.

2405 Bowditch, Berkeley 4, California January 31, 1959

GOTHAM 1805 Purdy Avenue Miami Beach 39, Florida

Gentlemen:

I just thought I would drop you a line and let you know how pleased I am with your V-80 vertical antenna. I have been using it for almost two years now, and am positively amazed at its performance with my QRP 65 watts input! Let me show you what I mean:

I have worked over 100 countries and have received very fine reports from many DX stations, including 599 reports from every continent except Europe (589)! I have also worked enough stations for my WAC, WAS, WAJAD and ADXC awards, and I am in the process of working for several other awards. And all this with your GOTHAM V-80 vertical antenna!

Frankly, I fail to see how anyone could ask for better performance with such low power, limited space and a limited budget. In my opinion, the V-80 beats them all in

I am enclosing a list of DX countries I have worked to give you an idea of what I have been talking about.

Wishing you the best for 1959, I am

Sincerely yours, Thomas G. Gabbert, KólNI (Ex-T12TG)

### OR IS K4ZRA THE NEW

CHAMP? Read his letter, and see his diagram of a typical installation and what it achieved:

> 2539 Christie Place Owensboro, Kentucky

GOTHAM Miami Beach, Florida Gentlemen:

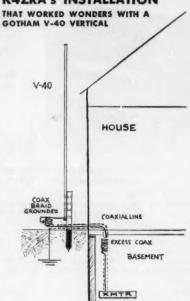
While I was at home last summer, I had occasion to use your GOTHAM vertical antenna on the air for about two months. I was quite amazed with the excellent performance of that inexpensive and simply installed antenna. It did everything you, KóiNI, and others said it would, in spite of the generally poor band conditions during the summer months.

During the time I used this antenna, I worked well over 100 DX stations in 44 different countries, earned a WAS certificate, and worked the necessary stations for WAVE, receiving very fine signal reports from all. My rig ran from 75 to 100 watts plate input and the receiver was an old military ARR-7 (Hallicrafters reboxed SX-28.)

The above mentioned contacts were made with the vertical mounted several inches off the ground, without radials, with only a simple ground connection to the coaxial shield. Later I raised the antenna up about 20 feet and installed the radials and this improved the already good signal pattern and enabled me to pick off another 12 countries and other DX contacts in a couple of weeks of good band conditions. In the latter part of August I used several single-band vertical and ground plane antennas and found that the single GOTHAM vertical equalled all these individual antennas.

Another attractive feature is the versatility of installation. It works high or low on ground, with or without radials,

### K4ZRA's INSTALLATION



mounted in any space. Of course I did find that the best installations were the two mentioned above, but they were fairly simple to arrange especially the first one!

The GOTHAM vertical is also a superior receiving antenna and I would strongly urge you to recomm that it be used for receiving as well as transmitting.

I just wanted to tell you how pleased I was with the overall performance of your antenna. For an inexpensive, easy-to-install, dependable antenna that really works for both DX and "local" W/K contacts, I don't see how one could ask for more and I would certainly recommend a GOTHAM V-40 to anyone desiring these features. Good luck in 1961 with those FB antennas! Sincerely, Daniel F. Onley, K4ZRA

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### **FACTS**

### ON THE GOTHAM

### V-80 VERTICAL ANTENNA

- If K6INI can do it, so can you.
- Absolutely no guying needed.
- Radials not required.
- Only a few square inches of space needed.
- Four metal mounting straps furnished.
- Special B & W loading coil furnished.
- Every vertical is complete, ready for use.
- Mount it at any convenient height.
- No relays, traps, or gadgets used.
- Accepted design—in use for many years.
- Many thousands in use the world over.
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- Withstands 75 mph windstorms.
- Non-corrosive aluminum used exclusively.
- Omnidirectional radiation.
- Multi-band, V80 works 80, 40, 20, 15, 10, 6.
- Ideal for novices, but will handle a Kw.
- Will work with any receiver and xmitter.
- Overall height 23 feet.
- Uses one 52 ohm coax line.
- An effective modern antenna, with amazing performance. Your best bet for a lifetime antenna at an economical price. ONLY \$16.95.

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Name.....

### Station Activities

(Continued from page 106)

3980 kc. at 1600, 2RN at 2345 and 0230 GMT on 3690 kc. Congratulations to K2GAO and WA2CIG on making the bPL. Appointments: K2GAO as GNS, WA2HWG as OPS. Endorsements: K2KTK as OO, WA2HTW as OES and WA2GGH as OBS. The NYSPTEN held its Annual Picnic at Green Lakes State Park with 61 families attending. I am sorry to amounce that W2RJY has joined Silent Keys. The Six-Meter Mobile Assn. of W.N.Y. (Buffalo) held its Annual Rag Chewers Family Picnic. K2KTK has a new tower for the 6- and 2-meter beams. WA2GCH operated at the Clinton Co. Fair. K2EQB built a W910 keyer. W2FSB has completed 35 years as a licensed ham and has sold his old equipment and replaced it with an HQ-180, a Valiant and a new TA-33 beam. He's working on 200 countries. W2RQF has converted ARC-5s for mobile and fixed use. WA2BPE has built a 6-meter converter for the SX-111. WA2LSJ reports the balloon launching was successful but there was transmitter trouble. The Air Force supplied a MARS an and area hams turned out to help. K2UMY has a new tower with 6- and 2-meter beams. W2QLI is now on 6 meters. With renewed interest in civil defense many area c.d. offices are more receptive to suggestions on low to make RACES plans more efficient through the purchase of new equipment through matching funds. W2LXE or I will be glad to advise any groups on correct pro-edures and lead moral support in necessary. All hams are invited to submit monthly reports of activities for inclusion in this column by the 4th of each month. rect pro eclures and lend moral support if necessary. All hams are invited to submit monthly reports of activities for inclusion in this column by the 4th of each month. Traffic: (Aug.) K2GAO 669, WAZCIG 554, W2EZB 458, W2CDE 416, K2SSX 258, K2QDT 131, K2RTQ 89, WAZALO 88, WAZKUS 74, W2RUF 49, WAZGLA 30, KZRYH 26, W2RQF 21, K2; LDG 20, W2ZRC 14, K2HOH 15, W2QQK 11, K2BWK 19, W2PU\*16, KZEE 2, W2PQA 3, W2QCI 3, W2KAT 2, WAZKZQ 2, K2KTK 1, (July) W2DPG 16.

WESTERN PENNSYLVANIA—SCM, Anthony J. Mroczka, W3UHN—SEC: OMA, RMs: KUN, NUG and GEG. The WPA Traffic Net meets Mon, through Fri. at 0000 GMT on 3838 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3858 kc. Mon, through Fri. It, in with deep nevert that we reconcil the received GEG. The WPA Traffic Net meets Mon. through Fri. at 0000 GMT on 3838 kc. The Keystone Slow Speed Net (KSSN) meets at 2330 GMT on 3385 kc. Mon. through Fri. It is with deep regret that we record the passing of the following annateurs: KWN, whose former call was 8GJM, and EUL, both from the Pittsburgh district. K6RZO visited with K3GQA recently, OEO can't work c.w. for awhile—sprained both arms. WRE received her A-1 Operator certificate. The Steel City ARC reports via Kilowatt Harmonies: The club scrap drive was a real success; RXT donated a Telerex 220-Mc. beam to the club; APN is taking on an XYL. OMA has been operating as K250M in the Canal Zone. MBN has been plagued with bad luck—heavy winds took down his tower and beam and he ended up in the hospital for surgery. The Cumberland Valley ARC, through Valley QRM, reports: ACH is working in Baltimore on Neuclear Power Plant for McMurdo Antarctica; the club meets the 4th Sat. of the month at Scotland, Pa. IRW is attending Duke University and will be on 6 meters from the school. ZZO is busy getting ready for project OSCAR. OX has been stricken by "Pigeon Disease" called "Cryptococcosis" and is listed as in serious condition in the Presbyterian University Hospital in Pittsburgh. The Etna RC reports via Ozeillator: K31SI and K31TH. a husband-and-wife team, have formed the Greater Pittsburgh Teen Age Radio Club for youngsters under 21 and holding an FCC tieense; OVM is running an HT-37 now; KDL has a new B&W 1500 on the air, SYY operated in the CQ Worldwide V.H.F. Contest. A new General is K3LIY. The Greater Pittsburg V.H.F. Society reports through Radio Log; K3DMT, EC for the 6 Meter AREC, with K3s IXR, IFK, GSP and MPD, did a swell job at the Air Force Slow, Allegheny County airport; DJM va ationed in Michigan with his 6-meter rig; a new licensee is K3QBI (he XYL to fewly. LIV is building a new QTH, K3KSY received his General is K3LIY. The Greater Pittsburg V.H.F. Society reports through Radio Log; K3DMT, EC for the 6 Meter AREC, with K3s IXR, IFK, GSP and MPD, did

#### CENTRAL DIVISION

ILLINOIS—SCM, Edmond A. Metzger, W9PRN—Asst. SCM: Grace V. Ryden, 9GME, SEC: PSP, RM:

USR. PAM: RYU. EC of Cook County: HPG. Section net: ILN, 3515 kc. Mon. through Sat. at 1900 CST. The Peoria Area Radio Club Hamfest was well attended and the gang went away happy after many eyeball QSOs. Compliments still are coming in for an FB job on the Compliments still are coming in for an FB job on the Central Division Convention which was held in Spring-field recently. The ILN handled 539 messages in 22 sessions and the North Central Phone Net's traffic for the same period was 177. Now that the summer slump is about over, many net managers have written and asked that those who are interested in traffic work contact their nearest NCS and become a member of one of the numerous nets that are in operation. The Calumet Area Emergency Net has changed its name to the Chieven. that those who are interested in traffic work contact their nearest NCS and become a member of one of the numerous nets that are in operation. The Calumet Area Emergency Net has changed its name to the Chicago Area Emergency Net, and its operation is on 160 meters. R9BGV is operating on 2-meter aeronautical mobile. K9ACC is starting a net of Boy Scouts who live in the Ninth District. K9PBJ is using a new AMECO nuvistor converter for his 2-meter operation. The new officers of the Bureau County Amateur Radio Club are PSY, IVU, KN9HSK, BMG, PWL and K9HCL. K9PVD has a new Spaulding tower with a TA-33 ir, antenna, JJN finally made DXCC and received his certificate. The Rockford Rel Cross station, RGU, is to be affiliated with MARS. HOA is recovering quickly from a kidney stone removal. New Novice calls heard were KN9HIQ, WN9ABU and KN9CCW. K9QMJ is pounding brass with a new TO4 keyer. The Western Illinois Radio Civil Defense Group supplied communications for the Quiney Golf Tournament on Labor Day so that scores could be relayed as played to the club house. The Joliet Amateur Radio Society visited the world's first electronic central telephone office at Morris. III. The office offers facilities of the future which will revolutionize the telephone industry. The new officers of the Six-Meter Club of Chicago are K9LTC. K9RNW, K9PAJ, K9QDY, K9UMV, K9PBN and K9EEC. New appointees are K9YG and K9QVA as OESs: K9VQA as OPS; BQC as OO. K9ORC has received his WAS and S8S Awards, DCC is the call of the new Edison Park Lutheran Church Amateur Radio Club, of which K9OMK is trustee and KN9WQZ is president. CIN and K9DSJ have left for the Navy. There are several BPL recipients this month because of the tremendous amount of traffic-relaying at the International Trade Show in Chicago and K91EM, the CARCC station, K90ZM, K9UOV, TEM, USR and MAK made tremendous amount of traffic-relaying at the International Trade Show in Chicago and K91EM, the CARCC station, K90ZM, K9UOV, TEM, USR and MAK made tremendous amount of traffic-relaying at

VQA 1. July) K9UOV 453, W9USR 272, QQG 77, K9QAE 15. June) W9IMN 1.

INDIANA—SCM, Clifford M. Singer, W9SWD—Asst. SCM: Arthur G. Evans, 9TQC, SEC: SNQ, PAMs: K9GLL, MM and RVM, RMs: DGA, TT and VAY, Net skeds: IFN, 0809 daily and 1800 M-F on 3910 kc.; ISN (s.s.b.), 1930 daily on 3920 kc.; QIN (training), 1800 M-W-F on 3745 kc.; QIN, daily at 1900 and RFN, 0700 M-W-F on 3745 kc.; QIN, daily at 1900 and RFN, 0700 Sun, on 3650 kc. Hoosier V.H.F. Net information is available from K9GLL. New appointments: K9PYM as EC for Ripley Country and GUX as EC for Lake County, K9DOF is OBS. Look for him on 2-meter f.m. RTTY. K9JKG is OES and K9OET is ORS. The Tri-State College ARC held a hamfest near Angola for members, their families and 6-meter f.m. enthusiasts. The Annual Big Bull Session sponsored by the Kokomo ARC was a big success. If you have not already applied for your call letter license plate, an application may be obtained from R. J. Thoben, Room 402, State House, Indianapolis, SNV is new on 2 meters with an H.B. 2226. New calls in the Monticello Area are KN9IGK, KN9IGL, KN9FOZ. KN9SHR and KN9HQL. The Tioga RAC is planning a traveling trophy for traffic-handling. The Tri-State The club's XYL Club provided entertainment for the ladies and food for the group. Those who missed the Central Division ARRL Convention at Springfield missed a very good event. The forums and meetings were especially informative. Amateur radio exists as a hobby because of the service it renders. Making BPL: JOZ and ZYK. August net reports: TT reports 51 for RFN, QIN total was 394 and QIN (training) was 30, as reported by VAY, K9GLL reports the Hoosier V.H.F. Net at 195. INN had a total of 415, reports MM. Late July reports: Hoosier V.H.F. 85, QIN 152 and QIN (training) 33. Traffic: (Aug.) W9JOZ 2817, ZYK 903, VAY 422, K9OET 378, W9TT 204, BUQ 188, K9HYV 176, IVG/9 172, CMG 39, GLL 139, W9NZ 128, K9YQ 106, LT1'9 85, SWD 79, BDG 78, K9WET 22, OFG 52, W9OG 45, RVM 45, GJS 41, K9KTL 28, W9CC 27, UQU 28, K9BHH 24, K9ZKU

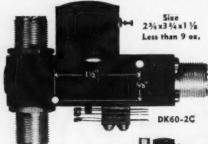
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24. W9FWH 23. IMU 23. DOK 22. YEW 20. K9DUV 19. LZN 19. W9DZC 18. RTH 17. K9ARW 16. HMC 13. W9YYX 13. WUH 12. K9YOR 8. CRS 7. LJP 7. AHE 6. SPH 5. ILK 4. W9JFF 4. K9YQA 4. FYL 2. GEL 2. IXD 2. JCD 2. RUD 2. W9TQC 2. BDP 1. K9TFJ. (July) K9GLL 81. W9DGA 18. YDP 3. K9DSY 1. (June) W9DGA 30.

WISCONSIN—SCM, George Woida, W9KQB—SEC: BCC. PAMs: NGT and NRP. RMs: VHP and VIK. BPL eertificates were issued to DYG and CXY. KKK has been reappointed as EC. The new Wisconsin S.S.B. Net now is in operation on 3985 kc. at 2400 GMT daily. OTL received his A-1 Operator Club certificate. K9GDF now has 1st-class telephone and 2nd-class telegraph licenses. He reports KH6BKO now is operating at HHX. Milwaukee School of Engineering station. K9AXB, new at Shawano. reports the new club there has as its officers, K9HMF, pres; K9AYB, secy.; and K9FPW, treas. LFK found his first RM certificate dated 1933. K9DTK is supplementing his han activities by playing the trombone with a 15-piece dance band at a summer resort. The Sun Prairie Club received DMG as its call. The 16th Annual Ground Hog Party will be sponsored by the Jefferson County Club at Watertown on the 2nd Sun. of Oct. BEN certificates went OQZO, GKO, CHG, K9s UTQ, ZCA, WIG, LCL, LGU. ZMI and HXJ. There are new keyers at K9GSC and K9YDY, K9WIE has his new 15 quad up 96 feet and is working DX, K9PZP/AA9PZP is on RTTY, 80 and 40 meters. Our section is in need of an OBs for both phone and c.w. for 7 Mc.; also more OESs, OPSs and ECs, OO VSO's antenna farm consists of three beams up 123 feet, inverted "V" for 80 meters and a vertical for 40 meters. More usable news is solicited for this column from clubs and individuals. Please renew your appointments on time. Traffic: (Aug.) W9DYG 855, CXY 637, W9NRP 49, OTL 39, K9SQV 32, GSC 31, WIE 29, GDF 80, W9VIK 26, K9WIG 18, DOL 17, W9MWQ 15, K9HDL 14, W9APB 11, K9DTK 10, GYQ 9, ZMI 6, CJL 4. (July) W9LFK 20, K9GDF 16, DTK 181, CJL 5.

#### DAKOTA DIVISION

NORTH DAKOTA—SCM. Harold A. Wengel, W@HVA—PAM: K@KJR. RM: KTZ. The North Dakota 75-meter Phone Net reports 26 sessions, total checkins 434. maximum 28, minimum 9 with 76 formal messages, 36 informal and 20 relays. The North Dakota Post Office Net reports 4 sessions, a total of 33 checkins, 2 pieces of formal traffic and 1 informal. A special thanks to those who kept the nets going during the summer. K9ESO and family have moved from Bismarck and now live at Wahpeton, N.D. K9HDA is active on phone. Traffic: (Aug.) K9IVQ 164, MPH 74, ITP 65, W9YCL 38, July) K9IVJ 94.

SOUTH DAKOTA—SCM, J. W. Sikorski, WØRRN—SEC: SCT. KNØJJY has moved from Sioux Falls to Huron. New calls in Sioux Falls: WNØAGD and KNØJHJ. PMA, VTX, SCT. NXX, DSK and KNØHQD operated two stations at the Dakota Centennial Gold Rush at Manchester. KØSEJ has published a South Dakota call book, containing listings of 729 amateurs in the state. It's an excellent job, listing stations alphabetically by calls, operators and cities. KØTPF is attending AF radar school in Colorado. KØTVJ and KØYUZ are at school in Springfield. KØKJS has moved to Minnesota. DSK is operating 2 meters from Milbank. KØYUZ are at school in Springfield. KØKJS has moved to Minnesota. DSK is operating 2 meters from Milbank. RRN has a new HQ-170. Newly-elected officers of the Sioux Falls ARC are SMV, pres; KØSZJ, vice-pres.: KØWEN, secy.; KØDYR, tress. ZWL's Weather Net ig has been rebuilt to 400 watts. Traffic: WØSCT 308. KØBMQ 131. WØDVB 67. KØYNR 26. YVC 16. WØZWI. 14. FJZ 13. KØBSW 12. DUR 10, YJF 7. WØAVJ. 14. FJZ 13. KØBSW 12. DUR 10, YJF 7. WØAVJ. 5. KØTKN 5. WØVYY 5. ZBJ 5. KØPDW 4. WØYNS 4. KØRQY 3. WØNNX 2, KØQMM 2, WØSEJ 2, TNM 2. TPI 2, KØTVJ 1.

MINNESOTA—SCM, Mrs. Lydia S. Johnson, WØKJZ—Asst. SCM: Charles M. Marsh, ØALW. SEC: KØJYJ. PAMs: POX and KØEPT. RMs: KLG and KØIZD. The 1961 Boy Scout Cance Derby on the Mississippi River between Red Wing and Winona served as a RACES exercise in which the Rochester Club members participated. KØRGP has a new Drake 2-A and an HT-37 transmitter. KØs AKM and UKU are RCC members. The New Ulm Radio Club, KØTSW, has requested AREC membership. The Jackson County Club has a base station and five 2-meter rigs on the air for cd. TUS is c.d. director for Cass County. MJN RM KØIZD has a 150-watt v.f.o. Command set on the air, SLD received an A-1 Operator Award. KNØJTA, a Novice in Benson, has a Timco No. 50 transmitter and an S-40B receiver. OOs LST and KLG reported five violations. KØVKQ will teach in Wisconsin College. (Continued on page 118)

# LOG

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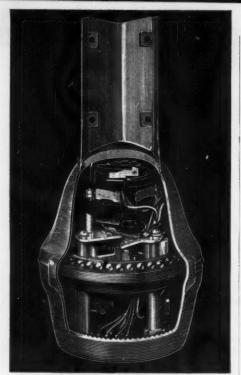
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a narrow-band 6-meter f.m. transmitter on the air. URQ attended the Wyoming Hamfest in the Big Horn Mts. KOVTG built an electronic keyer. RM KLG has a new Drake receiver. DXCC award winner KLG has a new Drake receiver. DXCC award winner KORDP has an SX-101A, an HT-32A, a 33A, a DB-23 Thunderbird beam duobander, a quad tribander, verticals and inverted "Vs" at his summer and winter houses. Thunderbird beam duobander, a quad tribander, verticals and inverted "Vs" at his summer and winter hories. Approximately 200 attended the Annual St. Cloud Picnic, KØZKK was admitted to the Park Rapids hospftal with a coronary condition. NYM and family are back from Washington State. Mobile Club members KØSTW, HOD, HCF, IVV, OAV, PML, WPK and WØSTPN and THY furnished communications for the St. Paul Open Golf Tournament. A reminder to all ARRL appointees: Regular monthly reporting is a must to lold your appointment, hence, the failure to report for three months invites a cancellation. (Sickness, vacations and other valid reasons are taken into consideration. Please check expiration date of your appointment and send certificate to me for endorsement before it becomes delinquent. Thank you. Traffic: (Aug.) WØKJZ 174. KØUKU 147. VTG 147. WØHEN 119. EST 91. UMX 65. ALW 34. KØPML 35. ZRK 37. WØOPX 45. KØAKM 44. WØDQL 44. BUO 37. KØZRD 37. WØKLG 33. FGP 28. RIQ 25. KØIZD 22. VPJ 22. WWR 22. JYJ 20. VPP 20. WØATO 17. KØISV 17. GPI 16. WØWMA 16. KØLWK 14. WØDXC 14. KØKYK 12. MPG 12. WØTHY 11. KØORK 10. RDA 10. ZRD 10. WØSLD 8. KØCIB 6. ICG 6, BAD 5. UBA 3. EUH 2.

#### **DELTA DIVISION**

ARKANSAS—Acting SCM, Odia L. Musgrove. K3CIR—PAM: DVL. RM: K5TYW. Now that fall is here and winter is just around the corner we should all check our emergency gear to make sure that the old power plant is running well and has plenty of anti-freeze. A check with the net controls shows that activity on the Arkansas Emergency Phone Net is up 10 per cent from a year ago. Activity on the OZK Net also is up with a lot of traffic being passed. TIE has been experimenting with 10 watts on 2 meters and says that he can pretty well cover the state with the 10 watts by using a ten-element beam. Anyone interested in getting a 2-meter net going should see him. RIT spent two months in the Veterans Hospital in Fayetteville where he underwent surgery. Arkansas now has three RTTV nets going with more stations showing up every day. New Generals are K5PRL and UGD. RIT has a new Cen. Elec. 200V transmitter and Drake 2B receiver. The Harrison Radio Club got a half-page of well-carned publicity in the local paper. Traffic: W58ZJ 46. DTR 25, K3IPS 9, W58MN 8, DYL 4, RIT 4, K5UEK 3, ABE 2, W5LHN 2. 2. W5LHN 2.

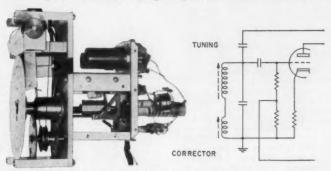
LOUISIANA—SCM, Thomas J. Morgavi, W5FMO—While Hurricane Carla was off the Coast of Texas and the accompanying winds were hattering the shorelines of Texas and Louisiana, the emergency nets that practice for such an event worked with clocklike precision aligning their members for the ordeal which followed when Carla finally hit the shore and started to really make trouble. The South Texas Emergency Net, the Delta 75 S.S.B. and A.M. Net the Louisiana Texas Emergency Net and numerous local nets were in operation. Your SCM took could be a supported to the south of the south the south of Betta 13 S.S.B. init A.M. Net. the Louisians reasis Emergency Net and numerous local nets were in operation. Your SCM took out time from monitoring the frequencies to bang out the activities of the month. K5LZA is attending Texas A.&M. K5FSW is at Ga. Tech. KSI and K3t SO teamed up after getting an urgent message from a Buenos Aires ham for six bottles of stathicillin to save the life of a dying girl in that city. With the aide of the parish and state police and with sureus screaning. Angelo and Marvin rounded up the six bottles and put them on a plane for Argentina. The New Orleans Hamicst was held Sun., Oct. 8, at Jackson Barracks. Your appointment runs concurrently with your ARRL membership. Please check the expiration of both and renew as soon as possible. Traffic: (Aug.) K5LZA 131, VHJ 110, QXV 63, W5MXQ 41, K5ESW 28, UYL 16. (June) K5QXV 96.

MISSISSIPPI—SCM, Floyd C, Teetson, W5MUG—Hurricane Carla really gave the fellows a workout. Messages handled runs into the several hundreds. Well done, gang. Jones County ARC has a new call, HKR CUU transmits Bulletins on 3925 kc. at 2230 hours. The Mevidian Club is busy fixing its new club house. K5YPV reports from Ripley that he is on with a DX-100 and an HQ-170. The Jackson DX Club, with CKY as presand K5JKH as seey., reports contacts as follows: CKY 292 worked, 291 confirmed; PW 190 worked, 167 confirmed; RDA 190 worked, 174 confirmed; K5JKH 216 worked, 200 confirmed (Continued good DX, fellows. WDR reports from Kessler that he has an Apache and an HQ-110. W9CTJ has moved to Illinois. New officers of the Columbia ARC are VPW. pres.; K5TAH, vice-pres.; KN5LHE, secytess.

### WHAT MAKES THE VFO IN A 200V LINEAR?

A combination of a unique electrical circuit and mechanical correction system.

The main tuning is accomplished by turning a shaft ten times to cover one megacycle between 5 and 6 mc. The main tuning shaft advances a powdered iron slug into a coil to lower the frequency. The main tuning coil is wound at a non-uniform rate; so the frequency versus dial rotation approaches a linear characteristic. Since it is difficult to control the winding accuracy to provide exact dial linearity over the one megacycle range, a second coil is connected in series to provide vernier frequency correction. The slug of



this second coil is mechanically arranged to obtain correction information from a hill and dale track created by the ball-shaped ends of 23 adjustable screws. One of the screws appears every 50 kc in an adjustment hole accessible through a plug button on top of the VFO. By progressively adjusting these screws, it is possible to make the output frequency zero beat with the kc scale every 50 kc across the VFO range.

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STRENGTH Is built-in to every E-Z Way Tower ... Heavy wall steel tubing legs, continuous diagonal bracing of solid steel rod and electriccally welded throughout....no loose bolts or nuts here. E-Z Way design and strength are your assurance of DEPEND-ABILITY that you can count on year after year. See your nearest distributor today or write for free literature.

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P.O. BOX 5767 TAMPAS, FLORIDA

K5EYS, from Decatur, is on with a TCS and an ARC-5, A new OPS appointee is K5QXF, Traffic: K5QXF 224, RUO 52, W4WDR/4 10, K5MDX 6, EYS 2.

TENNESSEE—SCM, R. W. Ingraham, W4UIO—SEC: K40UK, RM: K4AKP, PAMs: W4UVP, W4PQP and W4VQE, K4DIZ and K4HQT were married in August, We also heard that Sarah, K4DHA, is married, K40UK K40UK. RM: K4AKP. PAMs: W4UVP, W4PQP and W4VQE. K4DIZ and K4HQT were married in August. We also heard that Sarah, K4DHA, is married, K40UK has a new SX-111, K4TTA a new HQ-140XA. K4PUZ a new Warrior amplifier and W4PVD a new Globe King. W4PL reports he is doing a little better but is using the straight key. The Lenoir City Club has the call W4WVJ and is conducting code classes. The Kingsport Ham Picnic registered 79 hams and is definitely on schedule for next year. The Chattanooga Club is congratulating K4KTC on adding the 9th harmonic. W4UDT and K4QVV joined the Air Force; W4WXH the Navy The Oak Ridge Club is sponsoring an Explorer Scout unit with a specialty in ham radio and also is sponsoring K4UCV as a candidate for your next SCM. New appointments: K4UPX as EC, W4ZBQ as OO. Renewed appointments: K4UPX as K4VZC, K4LTA, W4RRV and W4HQA and W4FQF; clubs—Oak Ridge, Chattanooga and Lenoir City, Traffic: (Aug.) K4AKP 1205, W4PL 825, K4BWS 333, W4VJ 160. W4FX 137, K4YFC 127, W4PQP 75, K4OUK 59, W4UVP 42, W4IVM 34, K4AMC 30, W4UIO 23, W4TZB 20, W4TYV 19, W4UVL 14, W4TZG 13, K4FNR 11, W4SGI 2, W4YRM 2, (July) K4PUZ 11.

### GREAT LAKES DIVISION

KENTUCKY—SCM, Elmer G. Leachman, W4BEW—Asst. SCM: W. C. Alcock, W4CDA, SEC: W4BAZ, PAM: W4SZB, RM: K4KWQ, V.H.F. PAM: K4LDA. Kentucky Novice Net. WN4AGN mgr., reports a traffic total of 58 and 27 sessions. W4SZB, PAM for MKPN, is planning traffic schedules for the personnel of the 100th Division, Kentucky National Guard, activated to Camp Polk. Help! W4ZDB visited the Upper Kentucky River Radio Club, Hazard, Ky., which has thirty active members. W4JDU has eight licensed operators in the family-cheaper by the dozen, Woody, W4BAZ reports the Louis-ville AREC held an exercise with the Coast Guard Reserve. W4RHZ sends code practice three nights weekly ville 'AREC' held an exercise with the Coast Guard Reserve. WARHZ sends code practice three nights weekly on 6 meters. W4BEW handles voice traffic from the Pacific and the Far East to the Tri-State Area, Ky.-Ohio-W.Va. (as.b.). K4VDN transmitted six Official Bulletins in August. Because of a change in SCM some traffic totals were not received. Our apologies, Oo reports were received from K4ZQR, W4SZL and K4ZRA. W4RHZ is a new OBS. Traffic: K4KWQ 171, W4BZQ S. K4CSH 73, K4VDN 68, W4CDA 42, K4ZRA 40, WN4AGH 34, W4KJP 27, W4SZB 26, W4ZDB 28, W4YYI 19, K4VHJ 17, K4TQZ 15, W4BEW 12, W4MWX 12, W4RNF 11, W4SZL 8, W4RHZ 7, K4ZQR 6.

WASZL 8, WARHZ 7, KAZQR 6.

MICHIGAN—SCM, Ralph P. Thetreau, W8FX—SEC: ELR, RMs: SCW. EGI, QQO and FWQ. PAMs: CQU, JTQ. V.H.F. PAMs: NOR and PT. Appointments: KSCIS. EMD, K8PNX and UTE as ECs; K8KMQ as CRS: K8GQU as OBS; AHV, JVJ and THZ as OPS: EMD as OES, K8BXH is sponsoring a Great Lakes Novice Net on 3739 ke. Mon., Thurs. and Fri. Contact him if interested. The U.P. Hamfest attendance uss. 201; the W. Mich. V.H.F. Hamfest attendance 138. Albion ARC's new officers are K8TDF, pres.; K8RFJ vice-pres.; K8TCP, secy.; K8TDK, treas.; K8NFJ vice-pres.; K8NCP, secy.; K8TDK, treas.; K8NFJ vice-pres.; K8NFJ vice-pres.; K8NCP, secy.; K8TDK, treas.; K8NFJ vice-pres.; Vice-pres.; Vice-pres.; Vice-pres.; Vice-pres.; Vice-pres

(Continued on page 122)

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FCC. Traffic: (Aug.) W8OCC 182, IXJ 165, FWQ 150, K8KMQ 138, IUZ 115, W8JTQ 107, K8QIL 104, W8NOH 88, ELW 68, K8HLR 54, W8DSW 47, K8EXE 47, OTJ 41, W8ZHB 41, HKT 28, DSE 36, RTN 36, FX 26, K8MEG 21, W8WQH 20, EOI 18, IBB 18, K8KIT 18, W8EU 16, K8KQV 15, JED 14, NHC 13, PYW 13, GJD 10, W8AUD 9, SS 7, ALG 6, EGI 6, KSGOU 6, KVM 5, W8THD 5, THZ 3, K8LOS 2, (July) W8DSW 49, K8EXE 37, W8EOI 9, K8MEG 8, W8AHV 6, K8KVM 6, LZF 6, LOS 2, W8TIN 2.

9. K8MEG 8, W8AIIV 6, K8KVM 6, LZF 6, LOS 2, W8TIN 2.

OHIO—SCM, Wilson E. Weckel, W8AL—Asst. SCM: J. C. Erickson, 8DAE, SEC: HNP, RMs: BZX, DAE, VTP and K8ONQ, PAM: K8MFY, Appointments made in August were IBX as OO, K8SQK as ORS, K8KDK as EC. K8MTI received A-1 Operator, W-Del, DUF 1 & 2, DRD and WAG awards, K8VIX received HTH-50 and WAS awards, Canton ARC's Feedline has a beautiful sepia picture on its cover of HR seatel at his station. K8s UBK, UKH and YKL received their General Class liceuses, KN8s DQV and DQW (a father-and-son-team) are new Novices and WASABJ is a new Technician in the Canton Area; KN8AHB is a new Novice with a DX-20 and an HQ-170; K8JZN vacationed in Florida; FMW and GAB went fishing in Canada; TUY has a new Drake 2-B; K8SWE has a new SX-101, the stork brought haby girls to K8LBZ and to K8NSL; WA8ABC is a new ham: ex-LyZ-kL7NA-KR6JH-W6EDG is home on leave before going to Washington, D.C. Your SCM enlisted him in the Naval Reserve in 1934 and he still is going strong; the club held a picnic with 46 amateurs and their families attending; K8DVJ was home on leave from the Navy. The Clermont County AREC held a simulated emergency test with K8SYS as net control on 6 meters and EAJ as net control on 10 meters. Evendale ARC's new president is K8ANN and PNK is vice-president. Your SCM attended the Warren Hamfest with K8CYL NJH and QNT, at which 200 annateurs out of total of 333 registered, K8GGI won an HT-37, KDJ an SX-111, K8TCE an HA-4 keyer and ZXR a Heath HW 30 2-meter transceiver. K8ONQ and his XYL vacationed in Michigan. WRP and K8ANG are home after completively. IBX received WAFI, DVQ, WFKAS, ACISZ and Kans. Cent. awards. KNSBFM is a new Novice. SX-111, K8°TCE an HA-4 keyer and ZXR a Heath HW30 2-meter transceiver. K80NQ and his XYL vacationed in Michigan. WRP and K8ANG are home after completion of enlistment in the Air Force and Navy, respectively. BX received WAFI, DVQ, WFKAS, ACISZ and Kans. Cent. awards. KN8BFM is a new Novice. K8RNH is air mobile on 2 meters. K8KHH is now mobile. K8ZGF has a new Seneca, K8ZQI has a new Ranger and an HQ-100. Massilion ARC's MARC tells us that VYU is at WADC in Akron and K8EJV is at WDPN-FM in Ashland: new hams in the area are KN8BZI, DHT, DGZ, K8ZXG and ZNV after an absence of ten years; K8s HTM and LYR left for a hitch in the Navy; K8EKG is working in Pennsylvania. The Parms RC's PRC Bulletin informs us that nearly 70 members attended the Cleveland V.H.F.-PRC pienic: TGX demonstrated photo transmission and the club station now is using RTTY. Toledo's Ham Shack Gossip names BAH as its Hann of the Month and states that new club is starting locally to be known as the YL Experimenters and those interested should get in touch with HWX; K8S UVQ. VYW and YIN dropped the "N" from their calls; K8QAY vacationed in Europe: TIL. and VSB vacationed in Tennesses: FDD is on 6 meters; SOI made a trip to Florida; K8MHQ moved back to Toledo; K8s VOO and YON (a father-and-son team) received their General Class tickets. WRN asks all 144-Mc. operators within a radius of 30-60 miles of Columbus to be of assistance in reporting WOSU-FM signal strength at reporting station, which can report to WRN 8 on 144 Mc. giving your elevation, power, transmission line and antenna gain. This test is to show expected 153-Mc. coverage to aid in establishing a network of 153-Mc. stations to be located in hospitals in towns in this area described. Work WRN on 144 Mc. or write to him. We need ECs in the following counties; Allen, Ashland, Brown, Carroll, Crawford, Darke, Delaware, Fair-field, Fayette, Greene, Holmes, Licking, Marion, Mahoning, Monroe, Morgan, Morrow, Perry, Portage, Preble and the seconties, how about selecting a person to net as

#### HUDSON DIVISION

EASTERN NEW YORK—SCM, George W. Tracy, W2EFU—SEC: W2KGC, RMs: W2PHX and K2QJL. PAM: W2IJG, Section nets: NYS on 3615 kc, at 1900; XYSPTEN on 3925 ke, at 1800; ESS on 3590 ke, at 1800; MHT (Novice) on 3716 kc. Sat, at 1300. Endorsement: WA2ALO as ORS. K2ZEL, an OES, is taking graduate work in physica at Ohio State for PhD. A (Continued on page 124)



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new appointee is WA2IMG as OES. The Schenectady Club held its August Picnic at Sacandaga Reservoir. The New Rochelle Club reports 1258 contacts with 9 transmitters on Field Day. Schenectady reported 1185 contacts with 5 rigs. Both fine scores. At this writing it looks like there will be no call-letter license plates in 1962 for New York. We are in the same boat as Massachusetts, New Jersey and Kentucky. Reason—too slow to manufacture with tight production schedules. WA2QEG, the new Radio Officer in Pelham, worked 100 stations on 2 meters in less than a year. Mobiles covering the Westchester 'Fish Derby' were WA2JZA, WA2OBZ, WV2NRB WA3OCA and WA2DEK. The ESS Net held its picnic at Indian Lake with about 15 members in attendance. W2NTU is active again on 75 meters. The Red Cross N. Y. Mutual Aid Net (1st Sun. of each month at 1200) operates four simultaneous sessions on 3875 kc., 3556 kc., 7220 kc. and 50.70 Mc. Is your chapter represented by amateur radio? They tie into AmCross wire service at Syracuse and Brooklyn. The New York State Civil Defense Commission has moved from N.Y.C. to 162 Washington Ave., Albany, with plans for a new state control center in that city. Traffic: (Aug.) W2PIY 21, W2URP 18, K2TXP 7, WA2ATC 5, K2YJL 3, K2DEM 2. (July) WA2MID 62, K2EIU 38, K2TXP 17.

NEW YORK CITY AND LONG ISLAND—SCM, George V. Cooke. jr. W2OBU—SEC: W2ADO. RM; K2UFT. PAM: W2UGY. W.H.F. PAM: W2EW. Section nets: NLI, 3630 kc. at 0303 GMT nightly and 0015 GMT on Sat.; NLI (late), 3630 kc. at 0345 GMT nightly; NYC-LIPN, 3908 kc. at 2230 GMT nightly; V.H.F. Traffic Net, 145.8 Mc. at 0100 GMT Tue.-Wed,-Thurs. Your former SCM, W2TUK, is writing this column for W2OBU. George suffered a heart attack on Aug. 28 and is now recuperating at home after a month's hospitaliza-

### NEW YORK CITY OSO PARTY

November 4-5

The Bronx High School of Science Radio Club invites all amateurs to participate in the New York City QSO Party by contacting as many N.Y.C. stations as possible.

Details: 1) Contest period—Saturday Nov. 4
2300 GMT to Sunday Nov. 5, 2300 GMT. 2) No

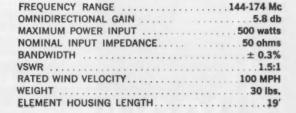
Details: 1) Contest period—Saturday Nov. 4
2300 GMT to Sunday Nov. 5, 2300 GMT, 2) No
time limit or power restrictions. 3) Scoring: At
least one end of the QSO must be a New York
City station. Each QSO is one point and the total
number of points is multiplied by the number of
boroughs worked times five. With five buroughs
—Bronx, Brooklyn, Manhattan, Queens, and
Staten Island—your maximum multiplier is 25
(5 x 5). This scoring procedure applies both to
N.Y.C. stations and out-of-city stations. There
is no multiplier for number of states worked.
4) Frequencies suggested: 3550, 14,100, 21,075,
and 28,100 kc., as well as six and two meters.
Prone frequencies are approximately in the middle of each phone band. 5) The general call is
"CQ NYC" or CQ DE NYC." 6) Send logs to
Bronx High School of Science, c/o Kenneth
Schaffer WAZBQK. 222 East 202nd Street, New
York.

tion. I'll pinch hit for George until he can once again take over. Continue mailing all reports to 3 Daisy Lane, Commack, BPL cards were earned by K2UBG, WA2GPT, W2EW, W2GKZ, WA2GLU and WA2EFN, the latter three on originations plus deliveries. WA2GLU operated portable in Connecticut instructing campers on amateur radio. The Washington Square ARS of N.Y.U. received its club call, WA2UZM. The station is located on the site of the original testing by Samuel F. B. Morse. WA2UJU completed a v.s.w.r. bridge. WA2IKT is on the air with an SX-99 and a 130-water, K2CMJ and K2DNY received ARL Public Service Awards. K2AAS is manager of the All Service Net which meets Sun. at 1700 GMT on 1720 kc. K2IVE passed the Extra Class exam. A transistorized mobile rig is under construction at K2HTX. WA2HMM put up a new ground-plane antenna and worked five new countries in two days. A Viking II is in operation at WA2MPP on the Ding-Dong Whitzer Net at 1245 GMT on 21,366 kc. Now that W2DQN has taken roots in Suffolk he is active with an HT-37, an NC-300 and a TA-33. W2ZAI reports that he Nassau County 10-Meter AREC Net has 96 members, The Long Island Mobile Association announces it transmitter hunts are held on 29.4 Mc. at 10100 GMT on Tue, and 0130 GMT on Fri. WA2GGB is chief engineer of Continued on page 126)

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NEW JERSEY



WA2QYE at the Walt Whitn:an H.S. A Johnson Challenger, an S-108 and an Amero converter are used on 6 meters at WA2KER. WA2OBN is operating with a Ranger, an RME-6900 and a vertical and hopes to add a Hornet beam. K2PQY is using a Johnson 6N2 and a new Gonset VHF v.f.o, WA2KYF passed the 1st-class radiotelephone exam with radar endorsement. WA2KSD received WAS, A-1 Operator and HTH (G) certificates. WA2NFI is enjoying traffic work and is adding an radiotelephone exam with radar endorsement. WAZKSD received WAS, A-1 Operator and HTH (G) certificates. WA2NFI is enjoying traffic work and is adding an Apache to his station. K2PFH hopes to be on the air from Italy with his HT-37 and HQ-189. WA2TJV has been appointed Asst. EC for the Queens Six-Meter AREC Net by W2LGK, County EC. WV2NRR is now WA2NRR, K2DZA is now engaged and reports the big day in scheduled for June. A new Gouset G-76 is the mobile rig at K2MYW. WA2RAS is now using an HQ-129X. It is with deep regret that I report K2EUZ as a Silent Key. Sol was the senior member of a 100 per cent amateur family and will be missed by his many friends and especially the Levittown ARC. WA2GJT had worked twenty 2-way s.s.b. states on 50 Mc. Keep rooting for W30BU's very speedy recovery. Traffic: (Aug.) K2UBG 329. WA2GPT 624, W2EW 549, WA2NMP 368, K2UFT 328, WA2BWO 329, W2GKZ 275, WA2GLU 262, WA2EFN 34, WA2CSE 42, K2ASAS 41, K2IVE 33, WA2NFI 33, K2CMJ 9, K2DME 6, W2PF 4, K2YQK 4, WA2CAF 2, WA2HMM 2, WA2DMP 2, (July) K2YMU 322, WA2PFM 14, W2DUS 30, WA2KER 29, WA2FTS 24, WA2CSE 17, W2DDS 30, WA2KER 29, WA2FTS 24, WA2CSE 17, W2DDS 31, W2DDI 6, WA2OBN 3, (June) WA2CSE 17.

W2DUS 30, WA2KER 29, WA2FTS 24, WA2CSE 19. W2DBQ 11, W2DID 6, WA2OBN 3. (June) WA2CSE 17. NORTHERN NEW JERSEY—SCM, J. Sparks Remecsky, K2MFF—SEC: WA2APY. RM: K2VNL. PAM: K2SLG, V.H.F. PAM: K2KVR. Section nets: NJN daily at 4000 GMT on 3695 ke., NJPN Mon. through Sat. at 2300 GMT and Sun. at 1400 GMT on 3900 kc., N.J. 6 & 2 at 4040 GMT and Sun. at 1400 GMT on 3900 kc., N.J. 6 & 2 deed GMT Thurs. and Sun. on 51.15 Mc. and at 0300 GMT Wed. and Sun. on 147.75 Mc. New appointer: WA2UZH as OPS. The NJN reports 31 sessions, attendance 433 and traffic 380. The NJPN reports 31 sessions, attendance 433 and traffic 380. The NJPN reports 31 sessions, attendance 433 and traffic 380. The NJPN reports 31 sessions, attendance 1248. The NJ. 6 & 2 Nets report 19 sessions, attendance 150 and traffic 33. WA2CCF, WA3CQI, K2UCY, WAZUZH and K2VVL earned BPL cards for August traffic. W2NIY received the WRONE And CNS awards. W2A2MH and K2VVE earned BPL cards for August traffic. W2NIY received the WRONE And CNS awards. W2A2MH and K2VEV has a broken right write but he hasn't let it keep him off the air. WA2COB has become a member of the A-1 Operator Club. W2QNI says that fishing with WA2QQZ is almost as much fun as traffic-handling. K2SCD is trying to form a net on 1296 Mc. WA2HFI worked two more states on 2 meters to give him a total of 11. WA2RDG, WA2SRK, WA2SOG and WA2SZK are new Generals in N.N.J. K2VZJ received his CP-20. K2PVH had his OPS appointment endorsed and K2VNL had his OPS appointment endorsed and K2VNL had his OPS appointment endorsed and K2VNL had his OPS endorsed. WA2CBB was unable to go to Hunterdon Co. for the N.J. QSO Party because of illness in the family who owns the farm. He expects to go there in De embers of you want a sked write to him now. WA2SIF has a new 10-meter quad on the air. W2AZZ'S son received K2LNX as his call, WA2CCF WA2MWU and W2TKZ visited W1AW. K2UKQ received FHC No. 1. K2KUR is experimenting with fluoride etching of surplus crystals. W2SID, W2SIE and W2SIF spent 10 days mobilitions to catch up on

#### MIDWEST DIVISION

IOWA—SCM. Dennis Burke, WØNTB,—SEC: KØ-EXN. PAM: PZO. Woe is me for failing to have my BPL candidates properly prepared for publication! Our section had some nice reports that did not appear in their proper place in the Sept. issue. It won't happen again. Thanks to all who report. It proves you are alive. LCX has been to the West Coast on vacation. RUM attended the Oskalooss Fair. Congratulations to the Boone Mike and Key Club. Four hundred hams. XYLs and harmonics were royally entertained at the 75-Meter Phone Net Picnic. Orchids to the Hampton and Sioux City Clubs for the two best ham sheets I have seen this year. AZJ is doing well picking up second harmonics (Continued on page 128)



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\_\_\_\_\_

for the KN boys. Don't be offended, fellows, it is for the good of the order. RFT reports another Project OSCAR under way at Decorain. The 75-Meter Phone Net reports: For July (late) QNI 992, QTC 163, sessions 26; for Aug., QNI 1348, QTC 241, sessions 27, Traffic: WØLGG 2394, BDR 1594, SCA 1574, DUA 782, NTB 381, CZ 311, RØJDQ/Ø 165, WØPZØ 189, KØKWO/Ø 114, WØAAE 69, KØZLN \$1, BFL 41, WØLJW 41, KØZCQ 33, POI 32, UAA 25, QWM 23, VHR 17, WØYDV 12, KØKAQ 11, BND 10, WØJPJ 10, KØWK 9, WØYOZ 7, KØAFG 6, EVC 6, GOT 6, PTL 6, WØGQ 5, SFK 5, KØEJN 4, MTI 4, WØQVZ 4, KØVSV 1, (July) WØLJW 42.

4. KØYSV I. (July) WØLJW 42.

KANSAS—SCM. Raymond E. Baker, WØFNS—SEC: KØIZM. RM: QGG. PAM: KØEFL. V.H.F./
PAM: HAJ. Section nets: KPN, 3920 kc. Mon., Wed., Fri. at 1245Z. Sun. at 1400Z: NCS× KØQKS. FHU. ORB, and IFR. Aug., 17 sessions, QNI 416 high 48, low 15, average 24.5; QTC, 95, high 17, low 0, average 5.6 QKS, 3610 kc. daily 0630Z; 19 sessions, QNI 165, high 10, low 2, average 5.5; QTC 54, high 24, low 0, average 2.8; NCS KØBKY, IFR, FNS and SAF. Area HBN, 18 sessions: QNI 391; QTC 255; NCSs ANT, KØHGI. WNZ, 5EWA, 5JXD. LGG and KØVFV. Jayhawker VL. Net, Tue. 1530Z 3940 kc. Sun. 2200Z. Appointments: BSS as OPS. KØZSG has a new SX-140. The Emporia Radio Club is very active in the AREC. TEZ is back on the air with a new Valiant. The Kansas-Nebraska Radio Club had a real crowd at its hamfest with 131 registrations. The Ham Butcher Net meeting was well attended with 175 registrations. KØHAO was chosen as Ham of the Month by the Newton Amateur Radio Club. QGG, our Route Manager, was Station of the Month on MARS. KØYEP now has a Johnson Invader. LEW has a new HT-37. We understand FNS has his hands on a 20A. Looks like the sound barrier has been broken. MVG worked 10 new countries on 20-meter c.w. in one evening. JAS is working skeds on 2-meter meteor scatter. QDH worked 10 new countries on 20-meter c.w. in one evening. JAS is working skeds on 2-meter meteor scatter, QDH has a new Elmac and a PMR-7. Traffic: (Aug.) WØOHJ 73. FNS 39. KØHGI 261. WØORB 88. KØHVG 83. WØABJ 75. IFR 47. BLI 23. KØEFL 15. QKS 14. LHF 12. WØTOL 11. KØYWG 10. ZHO 9. WØFHU 8. QGG 4. WFD 4. KØGQO 3, WØVBQ 2. KØYGR 2. (July) WØFNS 113, TOL 2.

### KANSAS CENTENNIAL QSO PARTY

December 9-10

The Kansas Federation of Amateur Radio Clubs invites world-wide participation in the Kansas Centennial QSO Party starting at 1400 GMT Saturday, Dec. 9 and ending 2359 GMT Sunday, Dec. 10. Kansas stations will worker Kansas, W.K and DX stations. Non-Kansas entries will combine c.w. and phone contacts to make one entry. There will be separate c.w. and phone contests for Kansas stations. The exchange will consists of signal report and ARRI c.w. and phone contests for Kansas stations. The exchange will consist of signal report and ARRL section or DX country. Kansas stations will send their county. The same station may be worked on more than one band. Kansas-to-Kansas QSOs will not exchange counties but send "Kansas." Each contact will count one point. Final score will be the number of QSOs multiplied by the will be the number of QSOs multiplied by the number of different location-multipliers (sections or counties). A county, sections, or country will count only once as a multiplier. Suggested frequencies are 3550, 3900, 7050, 14,050, 14,250, 21,050, 21,350, 28,050. 29,000, 52,000, and 144,500 kc. Certificates will be awarded to the winner of each section and country. Certificates will be awarded to the top 25 Kansas c.w. and top 25 phone entries. Send logs to: Kansas Centennial QSO Party Committee, 414 Avenue "C", Wichita, Kansas Logs must reach the Committee by Jan. 31, 1962.

MISSOURI—SCM, C. O. Gosch, WØBUL—SEC: KØLTP. Asst. SEC: KØLTJ. RMs: OUD and KØONK. PAMs: BVL. OVV and LFE (v.h.f.), Net reports: (Aug.) MEN (3885 kc., 2400 GMT, MWF) 13 sessions: QNI 278: QTC H2: NCSs: KØONK, RØVNB 4, KØMMR 3, KØKUDJØ, KØVPH 1. Mo. SSB: (3885 kc., 2400 GMT Tu. & TH.) newly-organized: Grist report in Sept. MON (3586 kc., 6100 GMT M.-F) 27 sessions: QNI 151: QTC 205: NCSs: OUD 10, KØCCQ GMT, MSD (200 GMT MSD) 200 CD 3, MSN (3715 kc., 2200 GMT, MSD) 25: NCS: QNI 115; QTC 162; NCSs: KØONK 9, KØVPH 6, KNØGFA, KØFPC 4, KNØGGB 2, Appointments: (Continued on page 139)



# See imaginative Mosley design of new CM-1 low cost ham band receiver at your dealer now!

FEATURES and PERFORMANCE:

Diode detector for AM and product detector for SSB, CW.
Calibration every 5 kc.
WWV reception at 15 mc.
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Less than 200 cycles change for 10% line voltage change. IMAGE and IF REJECTION: 35 db. minimum.

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The new Mosley CM-1 communications receiver offers you tried and proved components in a truly imaginative design concept. This compact new design gives you outstanding performance formerly only available in much higher priced receivers. Its unique crystal controlled first oscillator gives you excellent selectivity and freedom from image and other objectionable responses. The CM-1 employs five identical dual-purpose tube plus four semi-conductor diodes to perform all functions usually requiring more expensive 12 tube sections.

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Combination Crystal Checker, RF Signal and Field Strength meter. O-50 ma. meter for final amplifier tuning. Use as RF output indicator. Checks activity on third overtone transmitter crystals—checks fundamental and high overtone crystals at fundamental frequency. Powered by mental frequency. Powered by two 1.5 V. "C" cells.



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NEBRASKA—Charles E. McNeel, WØEXP—SEC: KØTSU. The Western Nebraska Net, reported by NIK, NC®TSU. KØAU, KØBMQ. RIJA and SWG. The Nebraska Senergency Phone Net, EGQ as NC, KØCGM as Acting NC, reports QNI 623, QTC 96, 100 per cent reporting KØCGM, VZJ and HXH. The Nebraska Section C.W. Net resumed operation on Sept. 1 on 3525 kc. at 1900 CST with OKO as RM. The Morning Phone Net, KØDGW as NC, reports QNI 626, QTC 160. The Grand Island Club Annual Pienic was well attended and the well-equipped cd. truck was admired by all. This is one of the best equipped and organized c.d., groups in the state. KØQFK operated portable from the Scotts Bluff Walther League Convention. KØVAZ will operate portable from N.U. in Lincoln with a new s.b. br iz, it is with deep regret we record the passing to Silent Keys of FLF and RCH. Traffic: WDDDT 121. OKO 111. KØMSS 70 WØVZJ 68, KØYDS 52. CGM 41, RRL 36, WØVEM 36. NIK 33. KØQVM 30. WØFSX 26. KØDGW 23, BRQ 22. WØYFR 29, LFJ 16. KØWEP 14, WØLDO 13, UVO 13, GGP 10. KLB 10. KØDFO 9, WØVZ 9, RJA & KØKJP 7, WØOCU 7, BOQ 6, LJO 6, KØFBY 4, KTZ 4, VTD 4, WØZJF 3, CIW 2. WPK 2. EGA 1, HOP 1, RIH 1.

#### NEW ENGLAND DIVISION

NEW ENGLAND DIVISION

CONNECTICUT—SCM, Henry B. Sprague, ir., WICHR—SEC: EOR. RM: KYQ. H.F. PAM: YBH. VH.F. PAM: FHP: Traffie nets: CPN. Mon.-Sat. 2300Z, Sun. 1500Z on 3880 kc.; CN, daily 2345Z on 3640 kc.; CVN, Tue. Thurs. and Sat. 0130Z on 145.98 Mc.; CTN, Sun. 1400Z on 3640 kc. RIGUD made the National Honor Roll for Oos. We need a replacement for him (he's in the Navy now) and a couple of other experienced amateurs as OOs who have a minimum of 3 to 4 years of consistent activity as General Class licensees on several bands. You are urged to apply for an appointment in this worthwhile activity. Kls IFJ and PGQ made BPL. KIIVR built a t.r. switch and was appointed asst. manager of a Novice net along with KINEF's appointment as manager. FVV reversed direction and is back on 144 Mc. with a Communicator IV and a six-element beam. APA has 50 countries on 40-meter s.s.b. and works KC4USV. KNIQIR NCSs a Novice net and likes traffic work. KIPKQ is building a nuvistor converter for 2 meters. KYQ reports the CN had 31 early sessions handling 291 messages for a 2-7 average. 41tendance averaged 11.6 on the first and 2.4 on the second. High QNI were NTH and KIs IFJ and PUG. YBH advises the CPN had 31 sessions with 220 messages handled for a 7.4 average. Daily attendance averaged 24 and the following made the attendance honor roll: FHF. YBH. DAV. Kis BSB, DGK, PPF and MBA. CHR's receiver died during a net session. By luck the trouble. a blown resistor, was found and replaced before QNF. The Waterford Radio c.d. group is now located in better quarters in the Town Hall, New members are RPQ. RO, Kis HNT. ARO, RTR. HXM, SWV, SWW and GHK. OBR is toying with s.s.b. and high-power linears. JZA has been working 8s. 4s and 3s with Clegg Zeus and a 10-over-10 beam. KIIFJ was appointed ORS. Appointments renewed: QV, YBH and APA as OPSs; YBH and QV as OBSs and APA as ORS. Reports received: OES from FVV and KIPKQ; OO (Continued on page 132)



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The WONDEROD whip is, of course, fiberglass (-all Shakespeare antennas are). And, because the fiberglass sheath (-a rod formed by exclusive Shakespeare process so that it won't take a set) is loaded dielectrically, the best impedence match is made with a shorter rod. Thus, you get full quarter wave efficiency from your 96" WONDEROD - with a full 6" more clearance than standard 102" metal whips.

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from K11VR. Traffie: (Aug.) K11FJ 584, W1KYQ 170, NTH/1 137, RZG 133, KIMZM 140, PGQ 133, GGG 129, W1AW 94, YBH 76, K1VR 61, JAD 59, PPF 57, W1RFJ 52, K1DGK 35, AQE 32, MBA 28, EIC 27, IVV/1 27, KN1QIR 26, W1CHR 12, CUH 10, APA 9, K1QCR 9, PUG 6. (July) W1OBR 49.

### NEW ENGLAND QSO PARTY

December 9 and 10, 1961

sponsored by The Connecticut Wireless Association

ALL AMATEURS IN THE SIX STATE AREA are invited to take part. The Conn. Wireless Assn. calls this its SEVEN-ELEVEN PARTY because the three operating periods are from 7 P.M. to 11 P.M. EST Saturday night, 7-AM. to 11 A.M. Sunday morning, and 7 P.M. to 11 P.M. EST Sunday night, 7-11 are lucky numbers. . . . Try your luck!

Eligibility: All licensed amateurs in New England are eligible and invited to participate. Only single-operator entries will be considered for awards. CWA members are not eligible for awards. CWA members are not eligible for awards. Immes: Three operating periods during the week end of December 9-10 will be utilized: 2400Z to 0400Z Sunday (Dec. 10), 1200Z to 1600Z Sunday (Dec. 10), and 2400 to 0400Z Monday (Dec. 11). See above for SEVEN-ELEVEN EST times. EST times.

day (Dec. 11). See above for SEVEN-ELEVEN EST times.

Frequencies: All amateur bands may be used. Each band with its sub-bands counts as one band for scoring purposes. For example, 80-meter c.w., 80-meter Novice, and 75-meter phone all count as 80 meters. It is suggested that the 25 kc. on the low edge of each band and sub-band be used. Exchanges: Call "CQ New England" on phone and "CQ NE" on c.w. The exchange will consist of QSO number, RS(T) report, name (or abbreviation) of county and state. For example WINXX might send: "NR 7 589 CUMBERLAND, MAINE." Scoring: Count one (1) point for each contact. Multiply total contact points by number of different countes worked. Multiply again by number of states worked. For example, WINXX works 50 stations, 35 different counties and 65 states. His score would be 50 × 35 × 6 = 10,500. Maximum possible county multiplier is 67. Maximum possible state multiplier is 6. A station may be worked once per band regardless of mode. Awards: A certificate will be awarded to the 1st and 2nd high scorers in each state; to the high scoring Technician in each state; to the high scoring Technician in each state; to the high scoring Technician in each state; in the high scoring Technician in each state; to the high scoring Technican in each state; to the high scoring Technician in each state; to the high scoring T

MAINE—SCM, Albert C. Hodson, WIBCB—K1ADY has been appointed PAM for the Seagull Net. We hope all who can will help her as net controls or siternates. The month of August showed renewed activity on 75 and increased activity on 2 meters with several openings and new stations on the band. BOK had a successful hamfest at his QTH with over 120 registered and many ir. operators present. The Cumberland County Emergency Network had a good time at its annual picnic. KIGFS, formerly of Yarmouth, is looking for Maine contacts from KR-Land on 20 meters. Best time 10-11 GMT. KIGVQ has the 813 rig going. KIMBM made the BPL. WST should have a new Apache on the air by now. KISXV has his General Class license and has been looking for old pals in EA-Land on 20-meter c.w. BPM now has WAS on each band phone and WAC phone. Congratulations, Dick. KIDTX had to get a new car to match his new mobile rig. KIACF. KIJMB, KIIAA. KILDM, KIHHX, KIJNN, KIDUG, KIDIK, KIMPM and KIHRK are all at college. KITDD and KIOVR got their Conditional Class licenses recently. KIPPM, and KIRPG also dropped the "N." Traffic: KIKSG 162, MBM 123, MZB 92, JNN 90. IMI 73, KVA 5.

EASTERN MASSACHUSETTS-SCM, Frank L. Baker, jr., W1ALP-AOG is our SEC. New appoint-



from 10 KCS The widest frequency range parameter in the industry to 54 MCS



SP-600 VLF



This unique combination of two matched SP-600 communications receivers

permits continuous coverage from audio frequencies (10 KCS) to VHF (54.0 MCS). Hammarlund SP-600 receivers have attained a world-wide reputation for excellent stability and calibration and have seen continuous use as laboratory and/or professional instruments for AM radio telephone, CW telegraph, AM-MCW telegraph, carrier-shift teletype, and in military communications.

HAMMARLUND SP-600 JX 6 bands provide continuous tuning from 540 KCS to 54.0 MCS. Stability of 0.01% or better at 540 KCS to less than 0.001% at 54 MCS. Sensitivity is 0.75 to 1.0 mv on CW and 1.5 to 2.3 mv on AM for a signal-to-noise ratio to 10 db. Provision for six crystal controlled fixed frequencies. \$1140.00



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FOR SSB Unexcelled SSB performance is yours through use of a Hammarlund SPC-10 converter and the SP-600 JX. The SPC-10 can be integrated with any standard communications receiver which has an IF of 450 to 500 KCS. It adds a degree of selectivity not found in commercially available receivers designed for AM/MCW. SPC-10

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—by Milton Kaufman—

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It is so effective as a teaching aid that it is the standard text in schools teaching commercial radio operating as well as by industrial organirations. All fundamentals required for all kinds of commercial licenses are included. Numerical examples in the follow-through discussion show how problems are solved and answers arrived at. There are many illustrations to make the technical questions and answers picture-clear. The manual is based on government study guide and supplementary FCC releases. In every regard, there is no equal to this book.

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ments: KIOLN Tewksbury, KIICJ Sharon, DDV Hanson as ECs; AQV as OBS; KIDRB and KNIRZL as OESs; KIIZM as OO. Appointments endorsed: WNP Concord, QXX Arlington, TZ (as R.O for Sector 2D), DOF Revere, AWA No. Reading, MKW Dennisport, MME Hull as ECs; DOF, PEX. AWA, NJL and MME as OBSs; NJL as ORS. DMS is working for BC station WOKW in Brockton, Heard on 2 meters; SZB. WXA, DA, KIs GDE, ROA, TBW, QAG, KNIs SGR and TKV. The Eastern Mass. 2-Meter Net had 22 sessions, 323 stations, 133 traffic, KNIQNZ has a net certificate. The net held a picnic with ZSS, DOM, OFK, KIs EKO, GUU, XYLs and friends attending. KIKTK has gone back to school. We hear that GYZ is now in Chicago. LAV is the new C.D. Director for Sudbury and KISTS is the new Radio Officer. KINTS will be on 2-, 0- and 40-meter cw. NF not HZIAB for a new one. KNIRZL has a DX-35 and an SR-34. AQV has a Ranger and a Gonset for 2 meters. Kall.WT,1 was mobile on 6 meters in these parts for a week, YHY was on the Cape for a rest. KNISMF, in Rowley, has a DX-20 and an AR-3. KIOPQ has a DX-100B on 160, 80 and 40 meters. KILJK has a cw. mobile rig on 40 meters. KIIDN has DXCC with 101. KILJK worked ZLHY on 40-meter c.w. KILUJ has his shack all paneled. EZV is heard on 75 meters. I received a nice copy of VHF Communicator put out by the Mass. V.H.F. Society. KIQEX has an HB-100W and an R.300A on several bands. KNIRZL has a sixteen-element beam and a "Twoer." The Yankee Club held an auction. KIICJ has a Gonset on 2 meters. KIIZM is ex-ZTDZ. DDV is R.O for Hanson and has a lot of equipment for 2 and 6 meters. AUU is on 80 and 2 meters. EEK is on 80 and 10 meters. KIDNB is getting out well on 2 meters working N. E and down into N.J. taking part in OSCAR Satellite GHZ has a Globe Chief Delux active on 6-meter c.w. TZ is moving into a smaller place in back of his other to New York and Canada on a trip. KIJIU was notion to N.J. QSO Party. The Eastern Mass. Phone Net on 75 meters has started up on 3893 kc. at 1739, You are welcome to check in, The Quincy cd. group has a new loc

WESTERN MASSACHUSETTS—SCM, Percy C. Noble, WIBVR—SEC: WIBVH/KIAPR. RM: KIIIV. PAM: DXS. Since the East. Mass. PAM has now set up an East. Mass. Phone Net on 3893 kc. the Mass. Phone Net as such is no longer in existence. It is now the West. Mass. Phone Net 6870 kc.). The MPN Picnic was not too successful with only four members in attendance. The SCM submits apologies for not attending, but since he was married only the day before perhaps you will excuse him! Hmmm. DEV has been appointed Emergency Coordinator for the town of Lee. New officers of the Hampden County Radio Association are STR. pres.; HDM, vice-pres.; IC, secy.; LRE, treas. EOB was elected president of the Conn. Wireless Assn., with JYH as treasurer. WMN activity was down during the month with only 71 messages cleared. Come on, you cw. men, let's hear you on WMN (3506 kc, at 7 p.M. EST). WMN continued its 100 per cent attendance in representation to 1RN. KILBB suggests that it would be very beneficial if each West. Mass. radio club could get at least one of its members to report into WMN regularly. What say? KNISGV, of Worcester, has been having excellent luck working 15-meter DX. LNG, an RM2, took part in the Armed Forces Day activities at NSS. The Friendly Rag Chewers Net held a well-at-

(Continued on page 136)

### NEW HORNET 40 METER BEAM

MODEL 40M2 Shortened 40 meter 2 element beam Budget Terms only \$5.50 per month

- \* FAMOUS HORNET QUALITY CONSTRUCTION
  - Special Cast Aluminum Fittings
  - . Heavy-wall 6061-T6 Aluminum Elements
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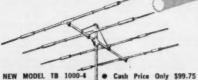
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tended picnic at the QTH of K1JAU. YXB is on 75-meter phone with very low power. LDE was sure a busy little bee during August. Look at his traffic total? Traffic: W1LDE 649, K1JV 183, LBB 114, W1BVR 87, YXB 46, WEF 43. JYH 14, K1DAJ 10, GCV 2.

NEW HAMPSHIRE—SCM, Ellis F, Miller, WIIIQ—SEC: KIGQK, PAM: KVG. RM: KIITS. GSPN meets Mon. through Fri. at 2400 and Sun. at 1430 on 3842 kc. The CNEN meets Mon. through Sat. at 1145 on 3842 kc. The NHN meets Mon. through Sat. at 1145 on 3842 kc. The NHN meets Mon. through Sat. at 1230 on 3865 kc. Endorsements: AZK as OES, PFU and KIITS as ORS, YHI and KICIG are planning a really active and reliable AREC Net for Hillsboro County. Thanks for your efforts, fellows, and here's hopes for success. BYS has moved from Concord to Salisbury. KIBCS reports a moved from Concord to Salisbury. KIBCS reports a moved from Concord to Salisbury. KIBCS reports a Am. eyeball. Your SCM had an FB visit from W2CLF, who frequently checks into NHN. Welcome to KNITIO, the son of our PAM. Best luck for an early General Class ticket, Tommy. With most everyone busy or on vacation we seem to have struck a new low in August from an activities standpoint. From now on we look for real improvement in all phases. Let's have at it! Traffic: WITA 133, QGU 125, CUE 41, HQ 16, JNC 10, KVG 6, BYS 4.

RHODE ISLAND—SCM, John E. Johnson, KIAAV—SEC: PAZ. RM: SMU. PAM: TXL. Section Net certificates were awarded to CFT, KIPZY, KIAUN, KIRFM KIMYU and KIJOD. RISPN reports 31 sessions, 371 QNI, 60 traffic. KIJWE has just received his Tech. Class ticket and has just completed an HW-29A. At present he is rockbound on 51.1 Mc. but a v.f.o. is his next project. The North Attantic Novice Traffic Net meets every Fri., Sat and Sun. on 3.745 Mc. at 2300Z. KINEF, who heads the net, invites all Novices to take part. The WIAQ Club of Rumford reports WRI certificate No. 11 has been installed at the club. The family outing held at Lincoln Woods was a huge success, YUT has returned to the club after serving in the Armed Forces. KIHMO and KIQLM have joined the USAF. KIJYN has entered a seminary. An exhibition of amateur radio equipment, old and new, will be held at the Old Slater Mill Museum, Pawtucket, R.I. This exhibit will run the entire month of February, 1962. Hams who would like to serve on a committee or have material to exhibit should contact the SCM. Traffic: (Aug.) WISMU 376, KINEF 190, PZY 39, DZX 30, PAM 12, WISMU 376, KINEF 190, PZY 39, DZX 30, PAM 13, WIWED 12, KILSA 8, KKY 6, AAV 5, GRC 2, (July) KINEF 35.

VERMONT—SCM. Miss Harriet Protor. W'EIB—SEC: K1DQB. PAM: HRG. RM: KRV. WPY. of Easex Jet., was the designer of the transmitter sent up in a balloon in a recent NAPS test. QNM has put up a new triband antenna and has been getting great results. KIIBH has logged 14 states mobile. K1BGC, HIN and HRG operated from Camp Drum. K1NKS has a new GIH. Cornwall, N.Y. Four applications have been received for the new Vermont certificate. Any of you who are interested should send in 25 QSLs that show you were their first Vermont contact. No more than five may be on 75, 80 or 2 meters. TFB has just returned from a trip to the Midwest, as has HFS. Traffic: (Aug.) VE2AZI/W1 2386. (July) VE2AZI/W1 1644.

#### NORTHWESTERN DIVISION

NORTHWESTERN DIVISION

TO AND SCM, Mrs. Helen M, Maillet, W7GGV—
VQC and GHY put the Latah County base station on
the air and aided greatly in alerting police, sheriff,
forest service and smoke-jumpers when a major forest
fire broke out 5 miles north of Moscow. The Magic
Valley Club elected K7LLA, presy; BMF, veep;
KNYPZD, seey.; K7CQQ, treas; GDA, act. mgr.; and
K7IUR, pub. chairman. For Project OSCAR trial-run,
BMF, GDA and K7CQQ built a 2-meter converter while
KNYPYS and BMF built a multi-element Yagi, K7AAV
unit a four-element fi-meter heam. New hame are RATPYS and BMF built a multi-element Yagi. RTAAV built a four-element 6-meter beam. New hams are KN7QKV/K7CKV. KN7QLN. KN7PYS and XYL KN7QAZ, RPB making a comeback with son KN7PZF, KN7QDT and K7OWJ, who dropped the "N." The Intermountain Weather Net is meeting again around 3975 kc, at 1410Z. RKI is mobile with a G-76. FARM Net traffic: 969. Traffic: K7KBY 167, HLR 63, W7GGV 13, EEQ 10, VQC 5, DWE 4.

MONTANA—SCM, Ray Woods, W78FK—SEC: BOZ, PAM: YHS, RM: K7AEZ. The MPN meets Mon.-Wed,-Fri, on 3910 ke. at 1800 hours, MSN meets Tue., Thurs, and Sat. on 3550 ke. at 1830 hours, DXM is teaching school at Saco this term. TVY was back in Helena for a visit from Florids. Blanche, IUM, had a visit from XG, Carl, of Spokane. Montana amateurs join in sympathy to RIL and his XYL on the loss of their (Continued on page 138). (Continued on page 138)

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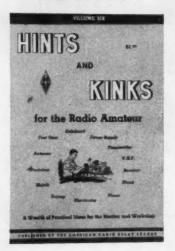
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small daughter. JAU is heard with a kw. in his ear. TGG made a tour of Southern Montana looking for old bottles, rocks and visiting hams. She took SFK along, too. FTD is sporting a new KWM-2 and is heard real well. K70GF moved to a new GTH with more antenna well. K70GF moved to a new QTH with more antenna room. RZY and MBV are experimenting on 2 meters. NPV is working on two-way Missile Man radios. INM and JRB visited in Harlowton in August. K7AZH is coming out with a homebrew s.s.b. rig. K7GHK and YHS are setting up a communications center in the Billings Area with VZQ on the tech. end, all for c.d. LPL will be back on the air from his new antenna farm. JPD is sporting a 4-place airplane. K7AZE, K70GF and JAU were on a half-hour TV program regarding amateur radio. Traffic: K7BKH 146, OGF 4.

JPD is sporting a 4-place airplane. KTAEZ, KTOGF and JAU were on a half-hour TV program regarding amateur radio. Traffic: KTBKH 146, OGF 4.

OREGON—SCM, Everett H. France, WTAJN—DEM reports the Southern Oregon Radio Club handled radio communications for the Hydroplane Race on the Rogue River, Mobiles were used by DEM, KEN, BUD and KTACB. They were assisted by EFR, KTCMV and KNTPMB, GUH, OO, reports he has been checking s.s.b. splatter on 7200 kc, KTAXF, EC, reports an increase in AREC members in Coos County, HRG, OO, has been checking on chirpy signals, BDU made BPL again, FB, Hank, KTIMH now has a home-brew rig on 22 Me., also a new 6360 exciter on 50, 144 and 229 Mc. and now is working on 423 Me, K7CBA acted as a mobile station at Timberline Lodge for a mountain rescue operation in search of a 19-year-old boy. KTEXP has new 6-meter gear, and also reports that ADR has made 65 consecutive days contact with KTIPI in Seattle on 6-meter ground-wave and wants to know if this could be a record, KTKTP, a new OO, is doing a good job according to his report. OSN has two new members, KTCVX and KTRCZ, and BRAT Awards go to MTW. ZFH, KTCNZ and KTIWD. Well, gang, that's all of the reports sent in. Traffic: (Aug.) W7BDU 342, K73VN T7, IWD 136, AXF 112, WTZFH 45, KTKCZ 39, WTDEM 36, MTW 29, KTCBA 22, CNZ 22, WTDTT 16, AJN 9, SMJ 31, KTZP 2. (July) W7GUH 7.

WASHINGTON—SCM, Robert B. Thurston, W7PGY—Washington nets are: WSN, 3535 kc, at 02002; WARTS, 3970 kc, at 01302; CBN, 3900 kc, at 02302; WARTS, 3970 kc, at 01302; CBN, 3900 kc, at 02302; WARTS, 3970 kc, at 01302; CBN, 3900 points in the Field Day exercises. IEU again is NCSing the Northwest Slow Speed Net on 3700 kc, MCC and MPH are vacation in Colorado. The VARC claims over 30,000 points in the Field Day exercises. IEU again is NCSing the Northwest Slow Speed Net on 3700 kc, MCC and MPH are vacation in Golorado. The VARC claims over 30,000 points in the Field Day exercises. IEU again is NCSing the Northwest Slow Speed Net on 3700 kc, MCC and MPH are vacation in Colorado. the winter skeds. YJE, No. 1 Hoot Owl, is reported getting ready to test the 185-watt 6-meter rig. K7BKX is moving back to Bremerton. LQI is operating one of those new Heath transceiver outfits. K7LED returned from a trip to Japan and way points. K7BBO is operating 2 meters. K7BOZ is heading for Illinois to work for Beeing. K7BFX is heading for Illinois to operating 2 meters. K7BOZ is heading for Illinois to work for Beeing. K7MFF is heading for Colorado for the school year. AXT reports he has joined the CAP frequenty. As of Sept. 12 IST is transmitting and listengen on 223-425 Mc at 0400 GMT for any contacts. The WSN Net had 23 sessions with 164 QNI and 66 QTCs in August. The first club meeting of the fall for the Spokane Radio Amateurs was held Sept. 4 and from then on every 1st and 3rd Tue, of each month. K7QOM has a Mohawk/Apache combo. K7KSE also has the same combo. OH has completed his new shack. K7DED has a new Drake 2-A. NXF has completed another copy of the 970 keyer. K7GZM revamped his Challenger for a pair of 6146s. K7CDI still is chasing bugs in the DX-100, along with remodeling his QTH. K7JRP is the proud owner of a new Mohawk. KNYS FW and OFX still are fighting out the WAS certificate. AOQ plans for a 50-neter vertical with a broadcast counterpoise. OEB says his trip to W6-Land was an eye-opener. K7DFS uses a Viking 500 for his early morning Montana skeds. Traffic: (Aug.) W7BA 1517, K71EY 350, WYDZX 683, KNYPIG 136, W7GYF 100. APS 86. AMC 58, KNYEI G 36, K1 K7EXT 46, GSG 41, WYOEB 20. AlB 41, KZ 11, GIP 7, BTB 6. (July) W7GYF 66, K7MF 42. (Continued on page 140)

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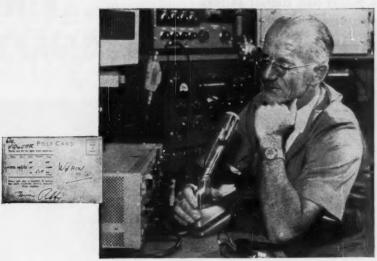
#### PACIFIC DIVISION

HAWAII—SCM, John E. Montague, KH6DVG—RM: KH6DVD. KIPLP/KH6 is now KH6EGL and KH6EGQ and is active on the POI Net. New RM KH6DVD has organized the new section c.w. net, POI Net (details below). KH6BZF and KH6DVG are the only active OOs in Hawaii. KH6IJ shared some of his vast knowledge of antennas with the Honolulu ARC members at the August meeting. KH6ECE is sporting a new "K." KH6BTV keeps Kauai represented on v.h.f. KH6ARL is helping the POI Net get on its feet. KGMNI/KH6 has been overhauling his antenna system. Keep an eye pealed for WVQQW/KH6, the XYL of K6MNI. Forty-nine new Novices received their calls in August. Official Bulletins are transmitted every weekday evening on 7290 kc. at 0400 GMT. Every anateur should be registered in the AREC; registration forms are available from the SCM. Section traffic net: POI Net. 7140 kc. Tue. and Thurs. at 1900. Traffic: KH6DVD 96, EGL 49, DVG 42, ARL 18, K6MNI/KH6 4.

NEVADA—SCM, Charles A. Rhines, W7VIU—An active ham is badly needed in the Las Vegas Area for appointment as EC. Contact SEC W7JU at 339 Birch St., Boulder City. There are now 9 active "2ers' in Boulder City. JU's 2-meter c.w. pipeline to Los Angeles continues open with no failures because of conditions in 2 years. PWE is being transferred to W6-Land. PHV is putting his mast up and should be on the air soon. KNTMNL won the Novice Roundup for Nevada this year. KHU continues the good work, turning in fine traffic totals each month. ZT is looking for hams in each county seat to man the statewide emergency c.w. net. Through some excellent work by GZT those of us who paid the §3 extra for our license-plate sticker this year can get it refunded merely by applying to our county assessor. Thanks, Joe, for the good work. Traffic: (Aug.) W7KHU 346. (July) W7KHU 282.

SANTA CLARA VALLEY—SCM, W. Conley Smith, K6DYX—Thanks to W6ZLO, PAM, for taking care of this report during the absence of your SCM. Both W8AIU and W9SEG are s.s.b, and K6DYX will be soon. K6VQK took a brief vacation trip to Kings Canyon and Sequoia. K6SMH has been on a two-week Naval Reserve cruse. W46HZM and W46GLQ are QRL at school. OLQ has a new vertical. W6RFF has overhauled the HRO-7. The new frequency measuring gear of K6MZN, OO Class I, is really "sumpin"—6.5 p.p.m. in four measurements in the May FMT. Our certificate hunter, W46HRS, is only two away from the C.H. Clutrecognition. Both Pop Nelson's son and nephew, W64VJ and W6AVZ, respectively, expect to be married in October, K6KCB, RM, has been appointed technical adviser for NCN. W6AUC is now a director of the South County ARC. Russ maintains skeds with Japan, Mexico and the Canal Zone, K6MTX, a new ORS, and K6GZ will be handling OSCAR traffic via RTTY, W6DEF has begun early planning for the annual SET. W46EIC reports formation of a large 75-meter mobile group within the AREC for Santa Clara County, The SCCARA had a booth at the Santa Clara County, The SCCARA had a booth at the county fair with K6VQK and W46BZE in charge. Traffic: (Aug.) W46CIQ 967, K6KCB 384, K6GZ 200, W46HZM 176, K6DYX 146, W6YBY 131, W64IT 116, W46LSS 88, W6DEF 66, K6ZCR 47, W6ZBJ 42, W6ASH 28.

EAST BAY—SCM, B. W. Southwell, W60JW—SEC: WA6HYU. ECs: K6VXK. W6FAR. W6WAH and K6HTJ. W46LVX made BPL in August. W6NBX is getting settled in the new QTH and is rebuilding, W46DKG, W6LKE, K60SV. W46JCD and K6JPR furnished communications for the Trail Ride up Mt. Diablo. W46LVX has started a new college senseter. K62YZ has a new QTH in Concord and has the 7-Mc. dipole up and is rebuilding his GG-813 final. K60SO is in the USNR at the Treasure Island Navy station. W64IL RACES supplied communications during local fire disasters. I regret to announce that W46KDH is a Silent Key as a result of a heart attack. The ORC had its annual auction Aug. 4. The NCN puts out an FB bulletin for its members. Contact W46LVX. RM, for information on joining the NCN, The MDARC Carrier was short because of hot westher and vacations. ECs, be sure to get your reports to W46HYU, the SEC, on the first of each month so a report can be tabulated and sent to the SCM. Thanks, W46HKD is the new sqt. at arms of the HARC. K68PP is designing Q8L cards for the HARC. K6HWL gave an FB talk on mobile operation at the August meeting of the HARC. W46KUN is back from W0-Land and (Continued on page 142)



E. Robson, VQ4ERR, of Nairobi, Kenya Colony, Africa

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has a new Heath Cheyenne, W6WSH is finishing up his patio so that he can start hamming again. WA6AHF was in the hospital with an injured back but is snapping right back. K6DKQ moved to Mission San Jose. K6VXJ's jr. YL operator is a new licensee. W6ICR has his Bandmaster perking with his new homebrew keyer. WA6NGH built a Knight kit de luxe receiver. K6KCB is technical adviser to the NCN. K6JZR is a new AREC member in the Walnut Creek Area. SEC WA6HYU flew to Toronto for Canadian Thanksgiving season. Traffic: (Aug.) WA6LVX 1106, K6OSO 111, W6NBX 2. (July) K6OSO 39.

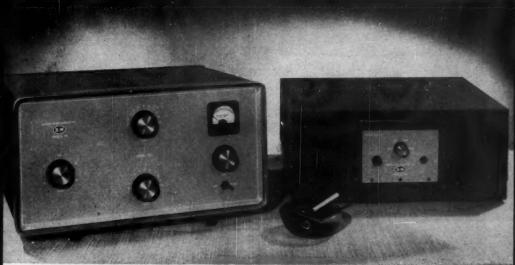
Season. Traffic: (Aug.) WABLVA 1109, ROUSO 111, W65BX 2. (July) K6OSO 39.

SAN FRANCISCO—SCM, Wilbur Bachman, W6BIP—As my first assignment as the new SCM of the San Francisco section I would like to thank K6ANP for explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work should be done. Our explaining to me how the work of the cool is said and slides very much. The S.F. Club pictic was a huge success with everyone having a good time in spite of the coolness of the day. Congratulations to W6QMO on receiving the ARRL A-1 Operators Club certificate. The beal fellows were very happy to meet W6SLX. Edward Kirkwood (Humboldt Radio Club), at the recent SF Club meeting. W6UDL and WA6ALK attended the Sonoma County Fair and Estelle and Art (Messineo) joined the Santa Rosa group in demonstrating at the TVI booth that the TV and amateur radio gear could be worked together without creating any interference. The HAMS Club has been having a steady increase in the membership list. The club station is now an official Army MA8S affiliate. The club call is W6MLK with W6GGC as trustee. With the National Red Cross station, W6CXO, an MARS Air Force Station with Frank Johnson, W6JWF, as trustee, both stations are well prepared to handle communications for any disaster if needed. According to reports from W6BYS the S.F. Naval Shipyard Club has not been as active as it was but the gang hopes to become active again real soon. No news was received from W46JGR, pres. of the BayLarc Club as she was away for the month of August, All clubs in this section are requested to please send me news of your club doings so I may include it hereafter in the monthly report. Traffic: W6GGC 19, W6QMO 11, W6GHI 8, W6JWF 7, W6BIP 4.

SACRAMENTO VALLEY—SCM, George R, Hudson, W6BTY—SEC: K6IKV. ECs: K6BNB, K6GOT and K6BYS. OBSs: K6AF, WA6CJU, W6WGO and K6HHD. PAM: W6GQS. OOS: W6WLI, W6CDO, K6ER, W6ZJW and K6EIL. ORSs: W6WGO and W6CEI. OES: W6PIV. OPSs: W6WGO, K6EIL, W6PIV, W6GQS and WA6PIV. The prexy of the Mission Trail says he is now on 2 meters and that the MTN is grained story. The second state of the trail of the Mission trail says he is now on 2 meters and that the MTN is grained state. OPS: WeWGO, KEILL WOPIV, W6GGS and WA6PVT. The prexy of the Mission Trail says he is now on 2 meters and that the MTN is going strong. The manager of the Northern Calif. Net advises that K6EIL is lisision on NCN up to RN6; that WA6ERC is installing break-in; that W4VIJ is taking an NCS spot; that W4UN again is active in NCN and that K6KCB is now technical adviser to NCN (a sneaky phrase for OO)! Flash: NCN broke all traffic records in August with 684 handled! K6HHD is a new OBS and will handle bulletin service for the RAMS Net. W6GDO and K6HHD (a fine husband-and-wife team) are handling traffic for the COSCAR' Net Wed. nights on 40-neeter RTTY. W6GDO has a new "rabbit ear" mobile antenna. WA6FCZ of the Yuba-Sutter Club, says the gang meets the 2nd Fri. of each month at the Yuba County Airport with all hams invited; that 2-meter activity up there is gaining. W46FCZ is on 145.35 Mc. nightly with a Communicator III and a ten-element beam up 18 feet with the best DX on inversion south to Taft. W6ZJW is putting up a new antenna for 20 meters. W6AF has returned from a motor trip to the Pacific Northwest. K6RRc and K6RPN have joined the AREC. W6WLI made flying trip to Cleveland and Milwaukee hand-carrying his Gonset III. and even with 15 crystals he still wished for a v.l.o.! W6JJK, the Aerojet Radio Club, has been showing some fine ARRIL films at regular meetings. News and views from clubs and individual members is needed for inclusion in your column. How about it? Traffic: K6ELI 264, W6WGO 35.

SAN JOAQUIN VALLEY—SCM, Ralph Saroyan, WeJPU—The Tulare County Radio Club was host at the SJVN pienic held at Mooney's Grove, in Visalia, with 150 attending, RéOGX won the 6-meter hunt, WegWL won a v.t. voltmeter, WeENF won a 2-meter transceiver. WeNCG, WeNAS and WeHYZ (San Joaquin Radio Experimentation, Inc.) are heading up a group of 20 stations on 2-meter f.m. covering an area from Bakersfield to Sacramento. The repeater is to be located at Meadow Lakes by the first of the year, Much work has been put into this project and it is coming along very nicely. WeNCG was made a papa again when WASEPK presented him with a girl (No. 4) Aug. 28. Grandmother KePEH relayed the information to (Continued on page 144)

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Grandfather K6PPI, in Fresno, by the 2-meter f.m. circuit. K6OJJ is bieng heard on 75-meter s.s.b. W6QFR has a new KWM-2 and a 30L amplifier installed in his power boat (yacht). K6GJD1 and K6FMY worked W6BJI, K6UDX and W6TZJ on 1215 Mc. from Mt. Hamilton. Signals were reported to be loud and clear. W6DUD and the 6-meter gang have started their 6-meter hunts every Mon. at 8 P.M. on 50.4 Mc. W6TZJ is mobile on 1215 Mc. WV6SLX is a new ham in Selma. K6OLN is working on 2-meter walkie-talkies. K6ROU got his DXCC award. K6CBR has a Drake IIA receiver. The SJVN in August had 610 check-ins, 96 contacts, a traffic count of 19, 7 QSTs, 2 bulletins and 27 sessions. Traffic: W6ADB 31, W6EFB 29, K6ROU 20, K6OLN II.

#### ROANOKE DIVISION

NORTH CAROLINA—SCM, B. Riley Fowler, WARRH—PAM: W4DRC, V.H.F. PAM: W4ACY, R.M: K4CPX. The Rutherford County Amateur Radio Club members are supporting excellent AREC and RACES activities in their area. K4PBG. of Forest City, has accepted appointment as EC. W4LEV keeps several fine traffic skeds, working W3CUL, W4PPC and WILDE on 215 kc., as well as KP4AZJ on 14 Mc. and W6YDK often on 21 Mc. Note our EC line-up. page 124 Aug. QST. Recommendations from clubs and actives (for ECs) for the Charlotte, Raleigh, Wilmington, Elizabeth City and Wadesboro Areas are earnestly requested by your SCM to further emergency radio stand-by recruiting and activity this season. Your SCM, W4RRH, was hospitalized for 20 days in early August with a badly-crushed left foot. At this writing, still confined to home and wheel chair, he expects to be about on crutches and mailing out some certificates by early October. He regrets the inability to get some locals to help out on this report; hopes all will give full support to N.C.'s nets this season. Traffic: (Aug.) W4LEV 1431. (July) W4LEV 1265.

SOUTH CAROLINA—SCM, Dr. J. O. Dunlap, W4GQV—SEC: K4PJE, RM: W4PED, PAM: K4KCO, W4PED and K4ZHV made BPL again in August. The C.W. Net handled 295 pieces of formal traffic in August, WA4BRW, WA4BRV, K4XPS, W4FDQ and W4VIW, of the Greenville Mike & Key Club, are all boasting new equipment. K4AVU and K4GAT may see the world with the Air National Guard. K4XZE and K4WJR have been issued Section Net certificates and are prospects for ORS the Air National Guard. K4NZE and K4WJR have been issued Section Net certificates and are prospects for ORS appointment. W4FFH has a new generator and also a new teletype on the air in preparation for the hurricans senson which is now upon us. In preparation also is the DX RC of Camden, which held an SET on Sept. 9 for AREC members at the local airport. The Kershaw State Park Picnic was well attended with interesting and timely talks by SEC K4FJE and W4BFD. Interest is shown by clubs in the formation of a State Radio Council. Delegates were sent to the Rock Hi? meeting on Oct. 7. Traffic: (Aug.) K4ZHV 299, K4BRP 208, W4PED 150, K4KT 116, W4XEC 93, K44CH 81, K4HDX 77, K4OCU 41, W4FFH 40, W4HDR 37, K4HJK 26, W4CHD 16, K4KCO 15, W4VIW 10, K4YFK 2. (July) K4ZHV 501.

26, WICHD 16, K4KCO 15, WAVIW 10, K4YFK 2. Guuy K4ZHV 501.

VIRGINIA—SCM. Robert L. Follmar. W4QDY—Asst. SCM. H. J. Hopkins. W48HJ—SEC: W4VMA. W4CVO, who now has his masters degree, visited KG1 and VO1 and was caught in a snowstorm in August 1. W4KXV received third place honors in last year's 4. W4KXV received third place honors in last year's 4. W4KXV received third place honors in last year's 4. W4KXV received third place honors in last year's 4. W4KXV received third place honors in last year's 4. W4KXV received third place honors in last year's 4. W4KXV received the intendance with their families were W4ESH. W4HPD. W4DX, W4OHT, W4ONN, W4TVT, W4TXD, K4AJL, K4QIX and K3PZN. K4AL has worked LA4K and wonders if anyone has dreamed up an award for this type of thing. Reports still are coming in of some pretty good FD scores. See this issue of Q8T for the full story. W4DLA and K4PQL have been awarded 4RN certificates. The Virginia Sideband Net has moved to 3935 from 3925 kc., while other section nets have continued to operate through the summer with the usual difficulties. The RVARC is going alaed with plans to hold a division convention in Roanoke in 1962. F.m. operation on 6 and 2 meters has captured the interest of a large group in the Lynchburg Area, W4ZM visited ARRL Hq. on his vacation and he has a new kw. linear, Want to get started in the traffic game? Try the VSN at 2336 GMT on 3680 or the VFN at 2400 GMT on 3838 kc. All members again are requested to mail their activity reports prior to the 4th of the month so that the SCM can meet his 7th-of-the-month deadline. All reports received after the 6th must be held over for the following month's report. Traffic: (Aug.) K4PQL 781, K4QIX 138, W4LOL 50, K4PQL 781, K4QIX 33, W4RHA 53, W4OOL 50, K4PQT 78, W4NVX 53, W4RHA 53, W4OOL 50, K4PQT 78, W4NVX 53, W4RHA 53, W4OOL 50, K4PQT 78, W4NVX 53, W4RHA 53,



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W4TE 20, K4IAN 18, K4IIP 14, K4PRQ 10, K4BAV 6, K4TFL 5, K4MLD 4, W4WBC 3, W4JUJ 2, W4OWV 2, W4KX 1, (July) W4PFC 956, W4OOL 54, K4PQV 47, W4BGP 35, W4PRO 4, K4IKF 2, W4ZM 2.

WHRGP 35, WPRO 4, KAIKF 2, WAZM 2.

WEST VIRGINIA—SCM, Donald B, Morris, W8JM—The West Va. Phone Net operates on 3890 kc. and the W. Va. C.W. Net on 3870 kc. Active ORSs, OPSs and OBSs are needed in the state at this time. JKN, of Buckhannon, is now LD. Bill was LJ back in the Twenties." K8VNL, ex-YL, won the HT-37 at the Bass Lake Pienic. NYH is active in the W. Va. and Va. Phone Nets. K8CSG reports RACES activity is going well in Marion, Wetzel and Cabell Counties. WHQ has well in Marion, Wetzel and Cabell Counties. WHQ has how high-power mobile on 3890 kc. for state contacts, OIV continues his fine OO work, ESH reports the Huntington Weather Net is operating on 30.55 Mc. at 1890 EST. RSMYU and RSLOU have earned West Va. Net certificates. It is with deep regret I report the passing of K8MXP, K8BLR continues to pick up new states on 2 meters. Traffic: W8NYH 72, K8MYU 42, LOU 29, CSG 12, W8JM-9.

#### ROCKY MOUNTAIN DIVISION

COLORADO—SCM, Donald S. Middleton, WØNIT—SEC: SIN, PAMs: CXW and IJR, RM: FEO. OBSs: KØDCC and KØEPD. YFL, NCS for CEPN, reports an all-time high QNI of 54 on Aug. 27. NVU, DXF and IA have given almost 1500 weather messages to the CWXN. WWJ has made 14 Denver contacts with his lo-meter walkie-talkie. Steve is now planning nerve tissue experiments with 1200 Mc. IQZ and NIT have rounded up much of the equipment for their 436-Mc. TV. The Pueblo SCARC members are sporting the new look in jackets. KØWJD was elected vice-president of the Optimist International. VDY, SIN, PSX, EXR, HPF, KØSJM, OVQ, EVG and PG participated in the successful search for a lost boy near Pine July 7. FKY is the new president of the Western Slope Radio Club. RX is preparing tape repeater equipment for Project OSCAR. Congratulations on making the BPL go to FEO. KØWWD and BES. Traffic: WØBES 590, KØWWD 521, WØFEO 440, KØWWJ 39.

KOWWD 521, WOFEO 440, KOWWJ 39, UTAH—SCM, Thomas H. Miller. 7QWH—Asst. SCM, John H. Sampson, ir., 7OCX, SEC: BLR. RM: OCX. QWH again was declared elected as SCM since his was the only nominating petition on file at League Headquarters by the closing date. This is somewhat discouraging. There are several amateurs in the section with the ability to take on some responsibility, and who also are probably more than willing if their friends would nominate and support them. In lieu of a September meeting the UARC held a picnic at Fairmont Park on Aug. 30, BAJ is turning in regular OO reports. Conditions on BUN during August were still bad but slightly improving, OCX, QWH and VEO earned BRAT Awards for work on BUN, OCX also earned one on TWN. Traffic: W7OCX 81, QWH 24.

TWN. Traffic: W70CX 81, QWH 24.

NEW MEXICO—SCM, Newell F. Greene, K51QL—
Asst, SCM: Carl W. Franz, 3ZHN. SEC: BQC. PAM:
ZU, V.H.F. PAM: FPB, RM: ZHN. The Breakfast
Club meets Mon. through Sat. at 0700 MST on 3838 kc.
NMEPN meets Sun. at 0730 and Tue. and Thurs, at
1800 on the same frequency. TWN meets daily at 2000
on 3570 kc. The Carlsbad Annual Picnic was enjoyed by
the 168 registrants. SA, HJ and others made it down
from Albaquerque. The usual caravan trekked from EI
Passt for the event. FPB spent his vacation(?) this year
doing paper work for the CAP. The Los Alamos Club
has started code and theory sessions. MQA has been
trying to overcome the difference between the MDST on
the "Hill" with MST elsewhere. Confusing! The Roswell Club is making an effort to get rolling with new
members and elections. Traffic: W3UBW 42.

WYOMING—SCM, Lial D. Branson, W7AMU—SEC:

members and elections. Trainc: Wo L BW 42.

WYOMING—SCM, Lial D, Branson, W7AMU—SEC:
Pending, The Pony Express Net meets Sun, at 0800 MST
on 3920 Kc, The YO Net is a c.w. net on Mon, Wed, and
Fri. at 1830 MST on 3610 kc, BHH reports several more
RACES members. The C.W. Net is on Wed, at 1900
hours and 20 members report in. The RACES Phone
Net is on 3920 kc, every night at 2000 hours with 35
(Continued on page 148)

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#### SOUTHEASTERN DIVISION

ALABAMA—SCM, William D, Dotherow, K4AOZ—SEC: K4JDA, RM: K4YUD, PAMs: K4BTO and K4PFM. New appointments: K4YUD as RM; K4UDK as EC for DeKalb County; K4WSB as EC for Marshall County; K4MIR as EC for Chambers County. Congrats to K4LNA on receiving an RN5 net certificate. WN4BDW invites all amateurs to check into the Spring-ville Novice Net at 1600 CST on 3725 kc. daily. K4HJM has moved to a new home in Annistron. W4CIU reports county: KAMIR as EC for Chambers County: Courats to KALNA on receiving an RN5 not certificate. WN48DW invites all amateurs to check into the Spring-ville Novice Net at 1690 C87 on 3732 ke, daily: KAHJM has moved to a new home m Amiston. W4C1U reports a new General in Townley is KilYM. K4ZNI is operating a new homebrew 225-watt 814 rig. 10 through 80 meters. W4DGH used a Ranger and an HQ-100 for portable operation this summer and gave out rare Cherokee County Q8L cards. K4LNA has a new Halli-crafters TO keyer, and reports a DXCC total oi 15 worked with 132 confirmed using 200 watts and dipoles. K4WSS, the new Marshall County EC, is hard at work registering all the hams in his county in the AREC program. Does your county have an EC? If not. contact K4JDA for possible appointment as EC. K4FTC reports that K4FK has dropped the "N." K4IWI, OO. is back from two weeks military duty. W4OQG reports the AENT training program now is in progress at 1615 CST Tue.-Thurs.-Sat. The following are liaisons from the AENT to the AENP: K4FTC, K5WSY, K4WSH, K4DJJ and W4MKX. K4ZYO operates a DX-100B and nYC-300. WX4BSE has a Globe Scout 680-A and nHQ-145. W4OXU reports new stations in Springville are WMACPF, WX4AZJ and WMAZK and that his XYL. K4WSK, has dropped the "N." and is now General Class. Wx3BUZ. in Huntsville. changed to W4MBU after only 30 days operation. W4HSU is in charge of the construction program for the Springville ARC. W4DS has completed the building of a Heath mobile transmitter and receiver for his emergency rig. W4RNX reports a new ham in Fort Payne, W4FNX. W4RNX is Communication sand RACES Officer for DeRalb County. K4SAV is attending the U. of Alabama. The following received AENM Sideband Net certificates: W4OWZ. W4POI, K4TNS and W4KCQ W4YSG. Officers of the work was a station of the

(Continued on page 150)

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For FEATURES and PERFORMANCE see page 129

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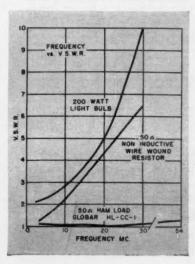


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Here's a new 50-ohm resistive dummy load that's ideal for all types of amateur service—fixed, portable or mobile. By switching the "Ham Load" into your antenna circuit, you eliminate on-the-air tuning and needless QRM. The unit also provides a dependable, non-inductive termination for testing equipment, measuring power and antenna matching.

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- Reduces QRM
- Increases Efficiency
- Dissipates 250 Watts Output

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essentially flat at less than 1.5:1 up to 54 Mc (with the load mounted at least 5" from metal reflecting surfaces).

For the name of your nearest supplier, write: Dept. QS-11, Globar Plant, Carborundum Company, Niagara Falls, New York.

#### SPECIFICATIONS

Resistance: 50 ohms, non-inductive

SWR: Less than 1.5 at 54 Mc

Dissipation: 250 watts (up to 5 minutes); 150 watts con-

tinuous

Connector: Standard coax (SO-239

type)

Size: Approximately 131/2"

long by 1" diameter

Mounting: Any convenient loca-

tion

Caution: Due to heating when

loaded at high power, the unit should be

mounted in freely circulating air.

#### CARBORUNDUM

Approx. one-half actual size



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WA4ABX 5, W4CIU 5, W4DS 5, K4ZNI 5, K4GRA 4, K4TDJ 4, W4DGH 3, K4AAU 2, W4RTQ 2, K4UMD 2, (July) K4LNA 61, WN4BDW 7, W4DS 5.

KATIDJ 4. WIDGH 3. KIAAU 2. W4RTQ 2. K4UMD 2. (July) K4LNA 61. WN4BDW 7. W4DS 5.

EASTERN FLORIDA—SCM, Albert L. Hamel, K4SJH—SEC: W4IYT, RM: K4KDN, RM RTTY: W4EHU. PAMS: 40 —W4SDR, 75 —K4LCF, V.H.F. W4EHU. PAMS: 40 —W4SDR, 75 —K4LCF, V.H.F. W4EMU, S. S. B.—W4CNZ, Section nets: FPTN, 3945 kc. daily 1730; GN, 7115 kc. daily 9830; GPN, 3650 kc. daily 1830 and 2200 EST; FEPN, 3910 kc. Tue. 1830; FSBN, 3940 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; FAST, 3940 kc. M.F. 1930; NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 1700; MCEN, 3940 kc. Sun, 1320. NHN, 3725 kc. Sun, 3725 kc. Sun,

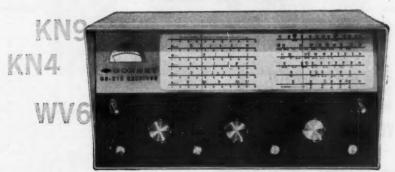
WESTERN FLORIDA—SCM. Frank M. Butler, ir., W4RKH—SEC: W4MLE, PAM. W4WEB, RM; K4UBR. New net managers for WFPN are: A.M. session—K4VLB: P.M. session—W4JOZ. Thanks are due retiring managers K4VND and W4WEB. The slow-speed c.w. net began Sept. 4 with K4JDW as net mgr. It meets daily at 01002 on 3509 kc. QFN sessions are held at 23302 and 0300Z. W4WMA received his ticket and has joined the AREC in Madison. W4KQP. in Perry, has a new linear. W4WEB has traded the old a.m. rig for an HTF-3T. K4CXG, in Panama City, has done likewise. W. Fla. hated to lose K4DSH to Jacksonville; W5AIY also transferred from Tyndall AFB. OES K2AZT is working on higher power for 6 and 2 meters and is mobile on both bands. W4OOW has a new Drake 2B receiver. K4PMT is active on WFPN from Pensacola using s.5.b. The Pensacola v.H.F. Club held an FB picnic at Ft. Pickens. New S/Line owners are K4HYL, W4HKK, W4PAA and W4OFV. The PARC is making plans to incorporate. K4KIF has a new Johnson 6N2 linear. K4BDF and K4QOJ are rigging up an emergency generator. New officers of the NAS Club are K6GEM, pres; W4OMX. vice-pres; K4FOG, seey, K4YYE has prepared a Q8L for the 50th Anniversary of Naval Aviation. See him for yours. K4QOJ is the new V.H.F. PAM. Contact him for information on section-wide 6-and 2-meter nets. Traffic: (Aug.) K4JDW 73, K4LOL 63, W4WEB 40, K4VND 27, K4SGY 14. (July) K4JDW 85, K4SGY 5.

GEORGIA—SCM, William F. Kennedy, W4CFJ—SEC: W4PMJ. PAMs: W4LXE and W4ACH. RM: W4DDY. The GCEN meets on 3995 kc. at 1830 EST Tue. and Thurs. 8090 on Sun. The GSN meets Mon. through Sun. on 3595 kc. at 1900 EST and 2200 EST with W4DDY as NC. The 75-Meter Mobile Net meets each Sun. on 3995 kc. at 1700 EST with W4LG as NC. The GPYL Net meets each Thurs. on 7260 kc. at 9000 EST with K4ZS as NC. The Atlanta Ten-Meter Phone Net meets each Sun. on 29.6 Mc. at 2200 EST with W4BGE as net mgr. The Georgia S.S.B. Net meets Mon. through Fri. on 3972 kc. at 2000 EST with K4RHB as net mgr. The Atlanta Radio Club Phone Net meets each Sun. on 21.36 Mc. at 2100 EST with W4DOC as (Continued on page 152)

138 LINCOLN ST.

# KN1 KN9 WV6 WV2 KNØ KN9 KN7 KN9 WV7 KN4 KN9 KN5 KN8 KN9 KN9 WV6 KN4 KN9 WV6 KN4 KN9 KN8 KNØ

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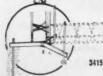
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WORLD RADIO LABORATORIES

3415 W. Broadway • PHONE 32 8-1851 Council Bluffs, lowa NC. K4ZYI tried to make CHC before going to college. K4LRD is attending Middle Georgia College. K4LRO is going to Emory at Oxford College. K4LRO also is going to Emory at Oxford College. K4LRO also is building a new 4-85 linear amplifier. The emergency net on 6 meters is increasing in activity, reports K4PKK. The Columbus Amateur Radio Club has started a code and theory class designed to follow through to General Class annateurs. Your SCM would appreciate more information from clubs to be used in this column. Don't forget to renew your membership-subscription to QST and also to check your appointments for renews. The Column College Charles (K4ZYI 307, W4DDY 167, K4QPL 41, W4HYW 38, K4FJD 32, K4RWM 30, K4UJS 30, K4BAI 17, K4LRO 17, W4LNE 4.

RAFJD 32. KARWM 30, KAUJS 30, KABAI 17. KALRO 17. WALNE 4.

WEST INDIES—SCM, William Werner, KP4DJ—C.D. Radio Officer: MC. My thanks to those who reelected me as SCM of this section for the twelfth year. AAA has resigned as SEC and now spends all his time on 15 and 20 meters. KV4BV, at St. Croix, applied for OPS and EC appointments. AFL has applied for OPS and 27 because of flood conditions affecting a large part of Puerto Rico. NCS AEB, at Humacao, was on with a 30-kw. emergency Net was alerted Aug. 26 and 27 because of flood conditions affecting a large part of Puerto Rico. NCS AEB, at Humacao, was on with a 30-kw. emergency power plant and two transmitters on both 3810 and 7245 kc. making simultaneous transmissions of taped USWB flood warnings besides handling traffic with stations sending reports to USWB and USCG C.d. nets also were activated on 3825 and 7295 kc. and 50.5 Mc. An impromptu net was formed on 7.2 Mc. by CL, the XYL of KP4CK, when she was asked by radio station WHOA to contact ammteurs around the Island for flood conditions in their towns. At 10:40 a.m. the government broadcast station WIPR also contacted CL with the same proposition and her contacts with ES, RD, HG, BY, WR, OA, YD, RA, WQ, ANJ, AOI, ANH, AKS, AGA, AXN, APB, AET, AOV AOH AMP and CK/mobile were rebroadcast to the general public on the broadcast band as well as the fim. band, CL was on the air from 10:30 a.m. until 6:30 r.m. claim of the contacts the biggest thrill was a contact with HYUCN at Vatiena City on the first day of operation. Civil defense has provided emergency power plants to the following amateurs: CK San Juan, PQ Ponce, YD Arceibo, WT Mayaguez, BY Ceiba, AWH Albonito, ANH Giuayama, and to amateurs at Aguadilla and Manaubo, KV4AA skeds Civil Defense Regional Headquarters station KIJZU on 147-5 kc. s.s.b. at 8:30 r.m. EST Wed. PJ finally is on with a new GSB—100 and a 101, a Drake 2B,

CANAL ZONE—SCM, Thomas B. DeMeis, KZ5TD
—Failed to get in the July report because of KR leaving for school in Philadelphia. Could not seem to contact stations to relay our report via the New York Area. MS has ordered an Apache and an SB-10. SH shifted location from Cocoli to Albrook AFB. CW is delighted with his new RME-6900. The club station at Summit will be reactivated with a KWS-1 and a 75A-4 with the call SU, WJ, also at Summit, will be working a BC-610 on 40, 20 and 15 meters, JT moved his station 3 blocks to new quarters, JD is using a DX-40, an NC-303 and a TA-33. HR is using a Ranger, an HQ-170 and a TA-33 ir. on a 25-ft, tower, The Crossroads ARC had a farewell party for BA and we will be listening from Ton W5HUM. VF is in New York studying at the Police Academy, TF and WI were visited by K4FTX and K4ZIF, from Fort Meyers, HFN is now General Class, JC went on a second honeymoon to Colombia and Peru, naturally with the XYL. KR just returned from Philadelphia where he attended a transistor course, SW (Continued on page 154)

Gateway



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now is running s.s.b. with a 10- and 15-meter quad and an all-band vertical 10 through 80 meters. GK is back on the air from Cardenas. Additional frequencies were allocated for KZ5 stations as of Sept. 15, 1961 for phone operation, 7150 to 7200 kc., 14.1 to 14.15 Mc., 21.1 to 21.2 Mc. and 28.1 to 28.45 Mc. have now been assigned to be operated on from the new date. The Liga Panamena de Radio Aficionados has invited the CZARA for a get-together to talk over some items of mutual interest to together to talk over some items of mutual interest to both parties. HPISB now is at the Great Lakes Naval Training Station, a new recruit for the Navy. MARS net activity has been fair to good but the AREC net has net activity has been fair to good but the AREC net has been very inactive, some of the more a tive members being away on vacation to the U.S., but we hope to have the net active again. DS has been at it with RTTY, KR is working on RTTY gear at the moment, Traffic: KZ5JW 136, CW 79, CD 51, TF 39, OB 18, AD 15, SH 9, HR 6, OA 6, TD 3.

#### SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Albert F. Hill, jr., WêJQB—Asst. SCM: Lyle G. Farrell, WêKGC, RMs: W6BHG, WaGROF and K6EVR. PAMS: W6BUK. W6ORS and K6PZM. The following stations earned BPL for the month: K6EPT, WaGDJB and W6GYH. Congrats, fellows! W6GYH was in the hospital for 15 days and is hone and handling traffic! K6CDW vacationed in the High Sierra country. K6SLM, WV6QNN, K6COP and W6GIRL hended back for schools and colleges. W46FBA is working with WA6BFC in the Arcadia C.D. K6VVN has a new W6FP coax antenna up. W46OUK worked Reno, Nev., on 6 meters. WA6CKR took a nice trip north in a ¾-ton camper rig. K6UYK expects to retire from the Navy soon. W6WNR is running a pair of 829Bs at 250 watts. W46KVS visited K6USA in San Francisco. W46KOK well be in Arizona for a vacation. W6VOZ has returned from the Tucson Area of Arizona. W6BES is busy traveling to New York and Florida, W6BHG spent a few days in the hospital and then made a trip to Enid, Okla. K6TVC is building some new W46FP is building a transceiver for his motorcycle! WA6GHW is looking for contacts on 10.150 Mc. K6EF is keeping plenty busy with TVI and CD work. Support your section nets: On c.w., the Southern California Net operating on 3000 kc. at 6300 GMT daily; on phone. He SoCal 6 Net operating on 30.4 Mc. at 6300 GMT daily, Traffic: (Aug.) K6EFP 399, W46DJB 520, W6CYM 143, W46KP 131, W46KP 132, W6WPF 333, K6OZJ 200, K6SIN 191, K6YVN 140, W46KQM 137, W46QFV 13, W46KYN 14, W46KWN 14, W46KWN 15, W46QFV 13, W46KYN 15, W46WWN 14, W46WWN 17, W46QFV 13, W46KYN 18, W46WWN 18, WONKR 10.

SAN D1EGO—SCM, Don Stansifer, W6LRU—K6BPI hit a traffic total of 2535 for August as a single operator, Ex-KM6BL is now WA6MLW in Spring Valley, and is active on all bands. W6DEY and his XYL, W6PJU and is active on all bands. WoDEY and his XYL, W6PJI. have come back to Santa Ana after vacationing in Canada. K6KYW spoke on s.s.b. at the Orange County Club in August. W6ELQ and his XYL, W46ATB, vacationed in their trailer for two months. K6LKD, in Escondido, made BPL in August with a traffic count of 574. W46HHJ/6 operated from the county fair in Del Mar and originated 140 messages, KH6DNO/6 is now on 6 meters in San Diego, Both W6BKZ and W6CAE visited W6LRU at his cabin in Mono County. The September meeting of the San Diego DX Club was held at the home of associate member W46BUX, who now has 102 countries worked with an Apache, a 75A-1 and a three-element tri-band beam. He is a senior at Pt. Loma High, W6WNN vacationed in Washington in August, K6ENX, in Escondido, tops the DX Club list his month, K6MSK, in La Jolla, now has 72 countries worked, and has added a tri-band beam to help things. Two night school courses are offered in the San Diego City and has added a tri-band beam to help things. Two might school courses are offered in the San Diego City Schools Adult program this fall for would-be amateurs, taught by K6JFP and W6LRU. Reports from Orange County indicate things are well planned for the convention next June with K6JJA in charge, and all committees (Continued on ware 156). (Continued on page 156)

SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

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"HAM HEADQUARTERS, U S A "

have been formed and are operating smoothly. W6DFR made DXCC in late August, Traffic: W6IAB 4361, K6BPI 2535, W6EOT 1077, K6LKD 573, WA6HHJ/6 140, WA6ATB 85, WA6CDD 80, W6DFR 64.

SANTA BARBARA—SCM, Robert A. Hemke, K6CVR—SEC: W6JLY. K6RWP has returned from a boat race to the Tahiti Islands. He was sorry that he bout race to the Tahiti Islands, He was sorry that he could not work more stations on the way over. Power troubles wouldn't let him. WeUWL is moving his QTH to Orange County and will be greatly missed by this section. The Santa Barbara ARC held its Annual Hamfest at Tuckers Grove. Prizes went to K6MQX and WA6HU. The Ventura County ARC held an auction which appeared to be a real success, The auctioneer was W6 Kansas City Dump. WV6RJP is the latest newcomer to the annateur ranks in the Orangrd Area. He is building a DX-60 and should be on the air in the very near future.

#### WEST GULF DIVISION

NORTHERN TEXAS—SCM, L. L. Harbin, W5BNG—Asst. SCM: E. C. Pool, 5NFO, SEC: K5AEX, PAM: AYX. RM: LR. I am happy to announce the appointment of AYX as your new PAM. JW is no stranger on the traffic nets and I am sure you will give him your support and cooperation. I was not able to attend the Annual Waco Hamfest this year and from all reports I missed a good time. As usual the Waco Boys did themselves proud. There were plenty of eye-ball QSOs and contacts with voices heard but never seen. I am sorry that more meetings like this cannot be arranged as I think it is the best way to promote the cooperation. and contacts with voices heard but never seen. I am sorry that more meetings like this cannot be arranged as I think it is the best way to promote the cooperation and pleasures of our fraternity. I had the pleasure of attending a meeting of a newly-organized radio club in Wichita Falls Aug. 31. The new club is the Red River Radio Club and has 21 members with K5ABG, pres.; K5YKV, vice-pres.; KØUXI/5, seev.; K5OUX, res.; K5YKV, vice-pres.; KØUXI/5, seev.; K5OUX is in the hospital after a 6-hour QSO on the table with a surgeon. The Dullas Carvan Club is holding a weekly transmitter hunt each Sun. afternoon after the regular net meeting at 1330 CST. ACK is the new net manager for NTX and reports the net is going good but needs more stations to check in to handle traffic. K5QWR, K5PAW and K5RAV have qualified as OPSs. 9AVB, ex-5KCQ, was a visitor recently. A word of caution—monitor the frequency before you hit the switch, a net may be in progress on that frequency. Traffic: K3QWR 301, W3BKH 158, ACK 123, GY 113, K5PXV 36, QPG 32, VWJ 27, SXK 20, W5GNF 19, AWT 3.

#### CANADIAN DIVISION

CANADIAN DIVISION

MARITIME—SCM, D. E. Weeks, VEIWB—Asst, SCMs: H. C. Hillyard, VOICZ, and A. E. W. Street, VEIEK. SEC: BL, WL recently returned from a trip to the United Kingdom where he visited amateurs in the Coventry Area. AEB has erected a 75-meter doublet over 30 feet up and reports good results. Recent vacationers to Hairax were VESA AAU and LK. New calls include AIC, at Fredericton Junction. SE has been added to the list of those who hold Old Timer certificates. HY has been appointed chaplain at St. Vincent's University and will be back on the bands shortly. You are reminded that ARRL Bulletin No. 814 does not apply to VE amateurs. (Lose still is on the banned list for Canadians). Once again I would like to appeal for volunteers qualified to accept Official Observer appointment. We badly need Obs who can spend a few hours each week in monitoring the bands. More information will be gladly supplied on request, Your correspondent is moving to a new QTH beside CFNB's 50-kw. transmitter and plans to have the 2-meter station back in operation at what should prove to a choice location for v.h.f. activities. Traffic: K1AFF/VO1 33, VEIOM 16, AEB 4.

ONTARIO—SCM, Richard W. Roberts, VE3NG—The weather during the month of August provided our portable and mobile units with a little more operating time. Many town and city calls were heard from vaca(Continued on page 138)

SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

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beam to 25 normal size. Linear loading and the Hy-Gain Beta Match also guarantee improved operation. 8.1 db Gain on 20M,

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4.9 db Gain on 40M. Single 52 ohm coax feed. 5KW PEP, 3KW AM. Boom: 24 ft., Elements, approx. 40 All aluminum constr-Wt.: 54 lbs. uction . .

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Powe. required for maximum output—6 or 12 volts for filamens, 300 V. at 75 ma. and 600 V. at 150 ma. Will also work with reduced output and with no changes from a 300 V. supply.

thru on all bands.

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tion and camping spots working portable or mobile. We are sorry to report the passing of JE, of Renfrew. The S.S.B. Assn. of Ontario will hold its Annual Dinner in Toronto Oct. 28. EAW, North Bay, has tickets. By the time you read this article the Windsor ARC will have held its Ontario ARRL Convention. CFR is active with a new G-76. VD still has his indoor antenna. The Kingston ARC had an FB Field Day. Four of its members were on a TV show from CKWS, TV, CAH, ATL, CKG and AXK were mugged, BEO, CLI, CVD, AXK, CJA, aNF will be on 2 meters this fall from Kingston. The PAMs and the SCM wish to thank those of you who were so faithful during the past summer season on the Ontario Phone Net. There were many nights when the old reliables filled in, Belleville and Kingston hams are going co-op on their Annual Dinner. The Ottawa Valley Mobile Radio Club is to receive its charter as a corporate club. BCL, BEB, CFU CSF, CSS, BLD, BCJ. BON and DSA were delegates to the New York Hamfest on behalf of Ottawa recently. OCU, at Carleton University in Ottawa, will be operating this fall and wishes to form a Canadian Varsity Net, especially in the East. The Niagara ARC had a wingding of a Weiner Roast, This was the club's annual event at TW's and DTW's QTH. The Seaway Valley ARC at Cornwall held a surcessful hamfest in September. EWT is now on the air, KJ has moved to VE8-Land until Christmas. Traffic: VE3BAQ 132, NG 99, DPO 69, DWN 37, DTO 34, RN 34, CFR 22, CF 18, EAL 17, OT 9, VD 4.

24, RN 34, CFR 22, CP 18, EAL 17, OT 9, UNN 37, DTO 24, RN 34, CFR 22, CP 18, EAL 17, OT 9, UD 4.

QUEBEC—SCM, C. W. Skarstedt, VE2DR—AZP corrects an earlier report on s.s.b., activity in Quebec City. He says UZ, ADL, PA, AB, BCD and he are active. JJ, at Nitchequon has applied for ORS appointment, Ex-Vo2AW at Goose Bay expects much traffic at his isolated QTH. A pleasant OT's corn roast was held at DR's place, with BE, BG, SF, TA and others attending. BE visited VE4s at the Brandon Hamfest, GQ, at Lake Marois will have his beam up soon, WW reports difficulties with the three-element 40-meter beam. ATL is now at Metane and visits RO and AWM. GE poured footings for the beam tower. A 2-meter beam, ATL is now at Metane and visits RO and AWM. GE poured footings for the beam tower. A 2-meter beam. ATL is now at Metane and visits RO and AWM. GE poured footings for the beam tower. A 2-meter beam old-timer; he previously signed VE3 and 4. NN says 1.2-kc. s.s.b. is maybe too narrow? QA will be recruiting for 20-meter beam erection. YU swears off quads after the sleet storm experience and now sticks to the two-element beam, BN has gone to Sweden, AFC enjoyed an F holiday and met over 100 DX friends. Radio Club de Quebec held its first fall meeting in September. AJS strains his ears for 144-Mc DX. TI's 15-meter beam is up 70 feet. AFX and AFC also are active on 15 meters. PA manages good results with an indoor 10-meter ant. ATD was married in June and expects to get back in the swing. ARO lives in Europe: you can find him on 15 meters as FSVE. AZT, a new-comer, will try 80-meter c.w. While in France AFC presented the "Trophic France" to FSRH. This trophy idonated by AFC and goes each year to the F station working the most French-speaking VE stations. Traffic: VE2DR 87, AGM 76, BG 33, EC 21, AGQ 7, JJ 2.

ALBERTA—SCM, Harry Harrold, VEETG—PAM:

VE2DR 87, AGM 76, BG 33, EC 21, AGQ 7, JJ 2.

ALBERTA—SCM, Harry Harrold, VE6TG—PAM:
PV. SEC: FS, The Southern Alberta Emergency Nct is
shaping up nicely. The Alberta Phone Net will be going
back on winter schedule soon. DB says 6 meters was
much better this past summer. There was very little
activity on 2 meters. TG now has his Hornet tribule
activity on 2 meters. TG now has his Hornet tribule
and will be off the air for sometime going to VE5Land. The Alberta boys are showing more interest in
s.s.b. The S.A. AREC is working on 3740 kc. each Sun.
At present there are about twelve on phone and four
on c.w. We need to get a group in the central part
and one in the northern district. Are you ready to take
part? If so, drop a line to the SEC, FS, at 443 19th
St., North, Lethbridge, Traffie: VE6HM 219, TG 7, AEN
5, BA 5.

BRITISH COLUMBIA—SCM, H. E. Savage, VETFB—Well, here are the three of us, your SCM, XYL, SH and Baby James alongside the river recommended (Continued on page 160)

SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1 low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

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JULY 1961

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CALL-D-CAL PO BOX 3915 TERMINAL ANNEX LOS ANGELES 54 CALIFORNIA

by AC and JD with nothing to do but fish, eat and sleep. Sleep and wait for them to bite.—Must write my report for this month tonight. What shall I say? Yes, the B.C. section has the most active annateurs. They send me hundreds of station activity reports by the first of each month. Net managers have their reports in by the 3rd and I can fill my quota for QST and have it in the mail by the 5th. None of the struggle most SCMs have to find news and get it away by the 7th. Our AREC program is complete and active and the SEC receives his ECs' reports monthly. Our TVI and BCI has been conquered and ITV is almost unheard of. All bands are active with B.C. amateurs and the world has no trouble in working a B.C. station. Hello! What, supper? My gosh what a beautiful dream. Please help it to come true. Send your reports!

MANITOBA—SCM, M. S. Watson, VEAJY—The Brandon Hunfest was a luge success. Congratulations to the BARC. After the fun and frolic held on Sat. evening Sept. 2 the main proceedings commenced on Sept. 3 at 11 a.m. in the Brandon Curling Rink. JT. master of ceremonies, introduced Norman Bergman, representing the City of Brandon and Chamber of Commerce, and G. R. Rowe, Civil Defence Coordinator for the Brandon District, who spoke briefly on the merits of amateur radio in various fields, YM then conducted a tour of the Brandon Steam Plant. FO won the 6-meter and CX the 75-meter transmitter hunt. The best mobile unit was won by LC with WOPHD second. During the P.M. KF gave a lecture and demonstration on v.h.f. G. L. Doesland, president of ARRL, and Vice-President Alex Reid then held a beef session answering all questions to the satisfaction of the hams present. At the evening banquet Fres. Dosland, W9TSN, and Vice-Pres. Alex Reid, VE2BE, were the principal speakers, outling the activities of ARRL and urging the hams to become more active in the use of the bands. MP won a hi-fi tape recorder. Bob Daye, BARC pres. and KN, editor of SPARKS, are to be congratulated on the efficient organization of the meet. Traffic: VE4QD 8, AN 6, JY 4, SL 2.

SASKATCHEWAN—SCM, H. R. Henn, VE5HR—

on the efficient organization of the meet. Traffic: VE4QD 8, AN 6, JY 4, St. 2.

\*\*SASKATCHEWAN—SCM, H. R. Horn, VE5HR—Now that holidays are over, activities will be on the upswing. The PEN (c.w.) Net and ARRL Phone Net will be busy. New members will be welcome and information can be had from NQ or QL. GN now signs VE7 at Victoria. AG has taken a position with the CBC TV station at Edmonton and will be VE6. XX and YY have moved to Quebec for a VE2 call. KJ had a nice time at the Waterton Hamfest, QC also was in attendance. MN has a new car and is in the process of changing mobile to 12 volts. I hope you have your selections in for a new SCM for the next two-year term. I have enjoyed working with you but feel this office should be passed around as I have had it for four terms. My term expires Dec. 10. GI is putting the VE5s' signals around on 6 meters. GG also is active on 6 meters and TF is building a 6-meter mobile. Watch for them on the high frequencies.

**European Fox Hunts** 

(Continued from page 80)

eliminated, especially as the foxes transmit one minute every five minutes — no cross bearings, no tactical problems.

The three Soviet hams taking part in the European Competition in Stockholm were probably better runners than any other participants, and their leader, the Hero of the Soviet Union Ernst Krenkel, well-known under the amateur call of RAEM, and their trainer UA3AF, can be proud of them. Their superiority in the 2-meter hunt is shown by the list of results below.

#### The Competitions

The competitions were preceded by a week of acclimatization, a week when our guests were guided by a number of Stockholm hams and had the opportunity to visit several homes and shacks. No talk of "east", "west" and "neutrals," just being radio amateurs and getting many new acquaintances!

Friday morning 4 August a dozen competitors started on 2 meters, Results, 2 meters (1) UA3AHA

(Continued on page 162)

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\$19 monthly

#### GSB-201 RF LINEAR AMPLIFIER

Big power rating! Small size! Power input rating 1500 watts PEP SSB. 1000 watts CW, 400 watts AM. Can be driven by exciters in the 65-150 watt category. Long-life silicon rectifiers used in the voltage power supply. Built-in antenna changeover relay. Panel switch allows tune-up at low power. No. 450X011, Model 3340 Ship wt. 90 lbs. .

10 METER GONSET COMMUNICATOR

SPECIAL

PRICE! \$16 monthly

Reg. \$299.50

A Radio Shack Exclusive! Three units in one, transmitter, receiver, and power supply. 40-50 watt transmitter has pi-network output. Receiver is sensitive, selective communications type with adjustable "squelch" for muted stand-by, "S" meter and effective noise limiter. No. 450X237, Ship. wt. 35 lbs. .



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No. 44DX600, 3341, 2 Meter ... No. 44DX604, 3342, 6 Meter No. 45DX012, 3351, Communicator IV, 220 mc. \$394.50

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and conveniences. Sn. Wt. 24 (DS. \$399.50 No. 440X61, 3338, G-76 ... \$399.50 No. 440X603, 3349, AC Pwr. Supply Wt. 28 lbs. \$145.00 No. 440X602, 3350, Trans. Pwr. Sup. Wt. 31 lbs. \$145.00 No. 440X612, 3265, Mounting Bracket ... \$ 3.95

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See Page 197 for Details

#### 6 Meter Antennas

3 ELEMENT BEAM \$13.95
Model #A50-3 Boom 6' x 1\%"
5 ELEMENT BEAM \$19.50
Model #A50-5 Boom 12' x 1\%"
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621 HAYWARD ST. MANCHESTER N. H. 1:14 (2) UA3ARF 1:42 (3) UA3TZ 1:43 (4) YU3BA 3:04 Teams: (1) U.S.S.R. (2) Yugoslavia (3) Czechoslovakia (4) Poland.

The next day more than 60 participants came to the 80-meter starting point, got their maps and the foxes transmitting schedules and vanished into the forest to listen to the first transmissions. Loops and ferrite rods were turned, bearings drawn on the maps, and the run began.

A couple of hours later the foxes began to send their reports to the headquarters, telling who had visited them, and to everyone's surprise it turned out to be a 35-year old Stockholm boy, not even a ham yet, who was the European champion on 80 meters.

Results, 80 meters (1) Gunnar Svensson, SM 1:10:30 (2) Ake Jonsson, SM 1:11:30 (3) SM5BF 1:13 (4) SM5BH 1:13 (5) UA3TZ 1:13:30 Teans:(1) Sweden (2) U.S.S.R. (3) Yugoslavia (4) Norway (5) Switzerland (6) Czechoslovakia.

What about a World Championship Competition the next time? That's up to you to join us, boys!

#### A Method

(Continued from page 41)

Distance Determination

Using Fig. 5, enter center scale (path loss) with 194 db. and adjust straightedge for equal distance on left-hand distance scale and 1296-Mc. distance scale. Find station working distance = 66 miles. If the distance was guessed wrong on the height gain nomogram, the new distance just obtained should be used in the height gain nomograph and a new answer obtained to correct the station gain.

#### Future Use

Once you have determined the values for your own station, mark them down and then you won't have to look them up again. This will make future computations easier.

Next time you plan to make a station change, make a computation of your "similar station" working distance, and see if it produces the desired result. Maybe just a small change can get you "over the hump" of Fig. 1.

#### Single-Band Grounded-Grid Linear

(Continued from page 41)

2000, adjust  $C_1$  and  $C_2$  for approximately 400 ma. Grid current should be 100 ma.

With the exciter adjusted for normal s.s.b. r.f. output, the linear amplifier, with voice, should (Continued on page 164)

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129 BURGHARDT RADIO SUPPLY INC.

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Keeps a constant check on your line voltage.

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for exceptionally fine tuning Superb craftsmanship by Jackson Bros.
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value — \$5.95.

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Another superb product of Jackson Bros. of England, 4" dia, dial with 6:1 ball drive ratio, Fits standard 34" shaft. For that velvet touch ...

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Versatile Miniature Transformer



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#### PENNWOOD NUMERCHRON CLOCK with 10 minute warning buzzer

10 minute repeating timer buzzes warning to sign in your call letters



Clock runs continuously

· Glolite dome shaped, full vision window glows in the dark · Walnut or ehony plastic case, 4" h., 734" w., 4" d.

plus applicable taxes Weight 3 lbs., 110 V. 60 cy. Price \$22.50 Numerical clock without 10 minute timer \$15.00

#### 24 HOUR CLOCK

23 5 9



24 hr. chrome plated 8" metal wall clock. Inner dial with south polar projection map of world indicates time around world. Polar projection dial adjustable for various time zones. Shpg. wt. 2 lbs.

110 V. 60 cy. \$8.47 12", 24 hr. clock, 110 V. 60 cy., without world map, \$13.95 These prices include tax

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sign that tells the XYL and guests yen're trans-mitting. Cuts down background QRM. Can book right into ceil of anten

heak right lats ceil of antenna change-ever relay for centrolled "ON THE AIR" signal when XMTG. Heavy gauge all steel construction with handsome black or gray baked finish, Can be used on desk or tabletop or mounted directly on wall. Dimensions 18%" lang x 3½" high x 3" deeps, Specify desired flaish in black or gray and operating voltage: 6 or 12 VDC, or 110 AC.

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See your Distributor or write CONTINENTAL ELECTRONICS & SOUND CO. 6151 Dayton Liberty Rd., Dayton 18, O. swing to approximately 150 ma, of plate current. A steady whistle will increase the plate current to 400 ma. The output should be checked for linearity with an oscilloscope during initial adjustment and at regular intervals thereafter.

For c.w. operation, use the same procedure as for s.s.b. operation, adjusting  $R_1$  for approximately zero plate current and the exciter for 100 ma. of grid current without plate voltage on the amplifier. Load the amplifier to 175 ma, with reduced plate voltage and then to 350 ma. with a full plate voltage of 2000.

#### Exciter Matching

Most exciters presently in use have enough range in output impedance to provide a match to the cathode circuit of the 813s. This impedance runs from a nominal 140 to slightly more than 200 ohms, depending upon the frequency. In the event that your exciter output impedance is fixed at 50 or 70 ohms, it may not be possible to obtain sufficient drive for the 813s. In such a case, a pinetwork such as shown in Fig. 4 may be used for matching. In this particular instance, the relative values of  $C_1$  and  $C_2$  near the correct-adjustment condition are such that the output capacitor,  $C_2$ , has a greater effect on tuning than  $C_1$ . Therefore, the input capacitor,  $C_1$ , rather than the output capacitor, C2, is used as the "loading" control.

The components can be mounted in a Bud CU-2107A 4 × 5 × 6-inch Minibox. Use SO-239 coax connectors for input and output. A piece of RG-58/U coax cable should be used between the exciter and matching network and a piece of RG-59/U between the network and amplifier will be slightly more suitable than RG-58/U if you happen to have some. Use No. 12 tinned wire for all connections, and keep leads as short and direct as possible.

#### High-Voltage Switching

Should you desire to operate two or more of these linears from the same high-voltage power supply, you can avoid the use of expensive highvoltage relays, and their associated wiring, by tying the h.v. terminals of all your amplifiers to the power-supply output. Merely turn on the filaments of the amplifier you desire to use and you are ready to transmit.

The operating-position photo shows the 28-, 21- and 14-Mc, amplifiers mounted in the author's home-built table rack. Antenna switching is done with the switches on the left while the amplifier selector switch is at the right, below the platesupply voltmeter.

I would like to express my appreciation for the technical advice of George Stinson, W9KDK.

(Continued on page 166)

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

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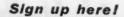
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#### World Above 50 Mc.

(Continued from page 89)

both W9AAG and K9AAJ, 2 way s.s.b. with K9AAJ, Both of these stations heard his (Dave's) 432 Mc. signal but no contact as Dave's converter for that band was not completed at the time. We have it on excellent authority that the converter has since been com-leted, and odd as it may seem "the job was done" on a day that Dave was forced to stay home from work because of illness. Ha mened to be only a day or two after the opening, too. On the sam: evening Se. t. 5) Texas, Oklahoma, Kansas, Missouri, Illinois, Louisiana, and Arkansas were worked and Missis-sippi was heard, at W58WV's QTH, W5HTZ and W5NW also worked the same stations and W5HTZ also worked W9AAG and K9AAJ on 432 Me bring that total up to 5 states on 432 Mc. Word concerning this same opening also received from Lee, K9AAJ who bemoans the fact of no converter on 432 at W58WV. He has it now, Lee-- watch for him pext opening. The contact with W5HTZ in Wewoka, Oklahoma, on 432 Mc, made state #4 for Lee on that band. Lee sez that September 7 was very good on 141 into eastern Nebraska and Kansas; and that such good conditions are truly welcome on two meters. Aurora has been scarce and tropo conditions beyond 300 miles almost nil for some time in that area although Lee did get WIAJR for state #30 in June. WA2EMA in New Jersey, comments that extended ground-wave has been good on 144 Mc. and on August 30 Bill copies stations in Pennsylvania, Connecticut, Massachusetts, New Hampshire, New York, New Jersey and Maryland with extremely strong signals. Bill is o, en for skeds for the meteor showers and hores anyone interested will get in touch. In Lansing, Michigan, K8BGZ remarks that conditions have been fairly good several evenings on 144 Mc. during August, with Iowa, Ontario, Nebraska, Wisconsin, W. Pennsylvania, W. New York, and southern Ohio coming through. W8BKI in West Virginia was also heard very weakly during one of the openings. A report from Thomaston, Connecticut, and K1PKQ sez that conditions on two meters were not generally good, but the openings that did occur were good ones. On the 5th of August stations were being heard from Scarboro, Maine, (W1COP) to Martinsburg, West Virginia (W8AEC); and on August 19 New York, New Jersey, and W4MKT in Winston-North Carolina were coming through. WSNOH, Grand Rapids, Michigan was hearing Illinois Iowa, Minnesota, Missouri and Arkansas on August 2 and 3; and New York, Pennsylvania, Kentucky, Ohio and Ontario on August 5, 6, 7, 8. Louie also mentions that new stations on 144 Mc. in that area are W8BEE and W8AXA, and that W8BEE is also building a rig for 432 Me. K4EUS got in on the tropo opening of August 18 and 19 when he worked the following stations on phone: W2JTI, K2LIO, K2CRG, W2JGY, W2CDO, W3QFD/3, W3HYJ, K3BRJ, W2RQC, K1CRN, K3HEC/3, K2BNK, W3CLQ/3, W2RQC, K1CRN, K3HEC/3, K2BNK, W3CLQ/3, K2RTH, W1AJR, K2SWZ and W1YQL (And they say I talk a lot! - W1HOY) K2HLA rejorts conditions very good from his QTH, 100 miles east of NYC on September 18, when he worked W118O in Waldoboro, Me., K1LPC at Gorham, Me., WIZKL at Waterville, Me., and WICOP at Scarboro, Me., all signals were from 5-7 to 5-9 and very steady, Dick also heard W1RPH at Deer Isle, Maine, 5-9 lus. After hearing announcements by K1CRN and K1LSY that the VE1s were coming in to New England, Dick started looking for VE1QY VE1MX, VE1CL and VE1ER, but had no luck even though he had their frequencies and knew they were on the air. He heard many N.E. stations acrking them, but it didn't push them through to Long Island. Line-up for 144 Mc. at K2HLA: Receiver-6CW4-417A-417A converter and transmitter 120 watts - 15 elements 65 feet high, and the location is 15 miles from the eastern end of Long Island. From Dallas (fooled ya!) Johnston, W9AAG, comes his side of the story of the opening on 144 Mc. on September 5. "W5HTZ was worked both (Continued on page 168)

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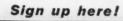
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on 144 and 432 Me. He sure was packing a wallop on 432, was up to S8 here during our contact. W5SWV was spotted on s.s.b. on 144 and worked but unfortunately he didn't have a converter working on 432 although he put a signal on the band and was S2 here in Woodhull, Illinois. W5IOW, Ada, Oklahoma was also worked along with W5NU in Savoy, Texas, and some stations in Kansas. Next morning between 8 and 9 A.M. CDST, W5IOW and K5BUX in Oklahoma were worked, and the evening of the 6th Kansas and Nebraska signals were good in here." Golly, two meters is beginning to sound like six meters when it's open!

K9SGD comes through with info on his rig and opening of August 27, 28, and 29. Joe is using an NC300 with 6CW converter and 6CW4 preamp; transmitting with a pair of 6146s at present but is in the process of building up a pair of 4X150s and s.s.b. exciter. He calls CQ nightly on c.w. at 0400 GMT, frequency 144.120. Usually calls two or three times in each direction. Joe would be glad to try skeds on c.w. with anyone interested. During the opening of August 27. KøKPQ in Clinton, Iowa was coming into Sparta, Illinois, 5-9 plus on phone. On the 28th Joe heard W8GGH, W8KAY, W8TYY, W8FW, and W3RUE, and worked most of 'em. On the 29th he heard W9HGP, W9RVM (worked them both), K8AXU, W4HJQ and W4G8K. Word received from K2ITP clears up the mystery of what happened to him and brother K2ITQ; seems they've been a-schoolin'. Activity is stirrin' up on 144 Mc. in the Huntsville, Alabama area; W4NKS, W4FUD, K4Z QM, K4IQU, W4CTG. K4MBM, K4FQA and W4WGI are either on or building WN4BMC equipment for that band. Seems that "Mike" likes to handle traffic on two meters; during the month of August she handled 360 pieces of it. Who see you can't handle traffic, messages, etc. on 2? Also worked W8QOH/MM crossing the Gulf Stream.

#### Correspondence from Members

(Continued from page 94)

know why this was. It has been the sad experience of many hams, myself included, that an apparently keenly interested beginner will throw the hobby aside when things don't go right. After one has seen many hours of his valuable time go down the drain in this manner, he will doubtless be hesitant about offering assistance of any kind to the beginner.

Notwithstanding my disappointing experiences with be-ginners, I would still find the time to offer assistance to any beginner who requested it, although the assistance would not be exceedingly extensive. I would most carefully answer any letter directed to this club through me. - Steve Godwin, KOZCJ, President, Communicators ARC, St. Louis, Missouri.

#### **UN-AMATEUR ATTITUDE**

In regards to Mr. Edward Wells comments in the September issue of QST criticizing RTTY operation in the 20-meter band; I feel that he is taking a very "unamateur" attitude. He must realize that the RTTY operators use very little of the alloted amateur frequencies in proportion to the c.w. men. I will admit that RTTY is not nearly as popular as c.w. and never will be, but Mr. Wells must remember that there are some amateurs who enjoy RTTY operation and devote most of their time to this phase of our hobby. Let's remember our "amateur spirit" and let the RTTY men have those few kcs. on 20 which I'm sure no 20-meter c.w. man will miss. I might add that I'm primarily a 20-meter c.w. man myself.

Let me take this opportunity to congratulate you on your wonderful League and magazine. I have been an ARRL member for four years and you can continue to expect my full support. May I urge every new amateur to join the League - it will be one of the best \$5.00 investments he ever will make in this hobby of ours. - Robert A. Sullivan, WøVYA, Minneapolis, Minnesota. (Continued on page 170)

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

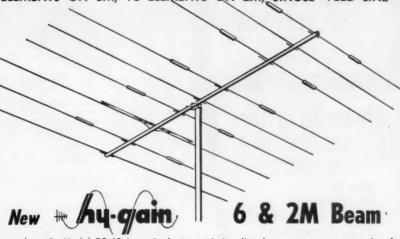
For FEATURES and PERFORMANCE see page 129

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- 11/4 Meter, 11 Element. Pre-tuned folded ratio dipole for low loss 450 ohm open \$13.95 wire transmission lines with the Model 111. Optimum spacing and high Q element design. Boom 12'; longest element 27". 14.2 db gain. Wt. 4 lbs.
- 3/4 Meter, 13 Element. The Model 313 is specifically designed for 430 mc oper-\$12.95 ation. Boom 8'; longest element 13-3/4". 16.1 db gain. Wt. 21/4 lbs.



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#### FINAL COURTESY

€ I have received a number of QSL cards that were marked or mutilated in the mail, and I would like to make a few suggestions about QSL cards which I think should be published in QST: 2) Use standard size rectangular QSL cards. Oversize eards do not fit in QSL files and have to be put aside. Odd-shaped cards get torn sometimes when they go through the cancelling machine. b) Use the mail-o-mat if your post office has one. If none is available, try to use a postage meter or have the cards hand-cancelled. Almost all of my cards that I received have undesirable black marks on the side where the call letters are. This is caused by contact of the card with the postmark of the letter in front of it before the ink has dried. - Ray R. Dopmeyer, K7JWY, Opelousas, Louisiana.

( I wonder just what a ham must do to arrive at that happy point where he can be certain of receiving a QSL for each one sent?

As has often been stated, the sending of a QSL is the final courtesy of a pleasant contact with a fellow ham.

While many appear to consider the acknowledgement of a QSO relatively unimportant, to me it is an integral part of our great hobby. I derive a certain amount of pleasure, as I am sure many others do. from going through my QSL file and reliving enjoyable past contacts.

I suppose, too, since I QSL 100%, I expect the other fellow to do the same.

And anyway, how is a guy going to make WAS, WAC, etc., etc., without those all-important cards? — W. S. Wade, jr., WA6JXM, La Canada, California.

**Q I** believe that the American amateur could do a little something for the foreign stations that send back QSL cards, DX in particular, and it need not be anything too valuable at that, Possibly an old Call Book, old copies of OST, some gear that is not being used anymore, or anything that is hanging around the shack you don't need! I have sent small inexpensive gifts to some of the amateurs throughout the world, and it has given me a lot of satisfaction to do this. Just something of appreciation will go a long ways in cementing friendship throughout the world with our good amateurs and neighbors. - Chas. W. Bocgel, jr., WOCVU. Cedar Rapids, Iora.

I have received cards from W/K boys (and others) who have followed your advice and are making use of GMT but have overlooked the fact that the date changes between 2359 and 0001 GMT.

If, for instance, a W# in Denver, Colo. works a G station at 2000 MST on the 1st October, then if he wishes to make use of GMT he must add seven hours which brings the hour to 0300 GMT but even though in Denver the date is 1st October, in England (at Greenwich) it is the 2nd!

There is no point in making use of GMT without taking into account the date; it only leads to confusion.

One thing which the ham to the west of Greenwich has over the rest of his fellows (if he religiously makes use of GMT) is that he can see the New Year in twice for the price of his fellow citizen's once. It can be a bit hard on the constitution though! - R. Johnson, G2FFO, Burnley, Lancs., England

#### C.W. M QSO

C Re: Excerpt from fancied c.w./m QSO with W3QV (QST Aug. p. 140):

W3OV DE K2OKI -- FR OM RUT NIL OLE HR -- GOD ES CM GAVE ME A L" ES A PARKING BRAKE ES A DIMMER SW ES A WINDSHIELD WASHER ES WUD HV EVEN WID STICK ES CLUTCH -- APTER 8 ? 8 YRS WID SLUSH YMIS-SION HY MADE HABIT OF LF ON BRAKE -- LAST TIME REACHED FOR DIMMER IN FOG GOT WINDSHIELD WASHED AFTER GOT OUT OF HOSPITAL DRAINED WASHER -THE WILL GO PHONE WID OF HEADSET ES LF OPERATED TR SW - W3QV DE K2QKI K - Phillip H. Ellis, K2QKI, Westbury, New York.

#### HQ VISIT

In August my wife and I had a most interesting time being shown the facilities at 38 La Salle as well as the installation at the transmitter site. I would like to thank both KILVW for giving us the fine tour, and WIUED for his (Continued on page 172)

## THE LATEST FROM HALLICRAFTERS

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Hallicrafters HA-2 and HA-6 provide a new approach to VHF operation. Now, with great simplicity, operators with 10 meter transmitters and receivers can operate 6 or 2 meters and enjoy this extended coverage.

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the transmitter final amplifier can be driven up to 120 watts input.

All modes of transmission and reception are useable with these units depending on the type of 10 meter equipment used.

- A nuvistor front end in the receiver section provides excellent sensitivity and noise figure.
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Hallicrafters power supply for these units supplies all voltages. Only one supply necessary for operation of either the HA-2 or HA-6 when used in stations set up for 6 or 2 meter operation.

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Employing digital techniques, its advanced circuitry features a constant ratio of dot-to-space-to-dash over the entire speed range of the instrument. Dots and dashes are self-completing.

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interest in a friend of ours. The workings of Hq. seem to be handled efficiently by the enthusiastic staff of 65. I was also impressed by W1AW in that it looked like a ham station operated by hams and not like a completely "professionalized" station to be seen and not touched.

May you long continue to help and maintain the enthusism and high standards that amateur radio is known for. Dick Klensch, K2AZJ, Trenton, New Jersey.

#### **Technical Correspondence**

(Continued from page 55)

nal or terminals to enter by, and for vision or other needful purpose requiring an aperture, for through round holes of moderate size large electrical waves do not readily pass, wereash through chinks or long slits, no matter how infinitely narrow, they can pass with - Lodge

"According to my present invention, I inclose the receiver in a metallic box. One-twentieth of an inch is a suitable thickness for the metal. The outside of the box is connected to one terminal of the telegraphic instrument and to earth respectively. The other terminal of the telegraphic instrument is connected to the relay circuit (inside the box) by a wire insulated from the box. A coil is placed on this wire outside the box. It is protected from mechanical injury by a wooden case; but this may be omitted. The coil may contain about twenty yards of wire one seventy-fifth of an inch in diameter and have one hundred and twenty turns. The coil is insulated with gutta-percha and covered with tin-foil. The tin-foil is in electrica connection with the box. The coil prevents oscillations of the transmitter from reaching the coherer at the same station through the wire," - Marconi.

- D. C. Mead, K2ZZF

#### How's DX?

(Continued from page 85)

(Continued on page 174)

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

HENRY RADIO

Butler, Missouri





# FORT ORANGE Radio Distributing Co. m.

4 BROADWAY ALBANY 4 N.Y. U. S.A. AMATEUR HEADQUARTERS

Cable Address "Uncledave"

CALL ALBANY HE 6-8411

NITES GR 7-5891

NOW THAT LONG WINTER EVENINGS ARE COMING, YOU WILL WANT THAT SHACK OF YOURS TO BE IN SHAPE TO HANDLE THE INCREASING ACTIVITY OF THE BANDS WITH THIS HALLICRAFTERS EQUIPMENT



MODEL HT-37.

The HT-37 has been carefully engineered to give you the best phasing unit at a moderate price. Complete tabletop high effi-



MODEL HT-41.
Truly a ham's dream! The HT-41 linear amplifier is an ideal companion for the HT-37 in price, style, and performance. Complete coverage 80 thru 10 meters; adjustable

pi-network output; all circuits metered; built-in R.F. output meter to aid tune-up; standby bias supply. High efficiency, grounded-grid circuit; new 7094 beam-power. \$395.00



MODEL HA-4 "T. O. Keyer." "The Stradivarius of Electronic Keyers." Hallicrafters offers this equipment for the discriminating c.w. operator who wants perfection. The



MODEL 5-120. Another popular Hallicrofters precision-built receiver with many desirable features: Covers broadcast band 550-1600 kc. plus three short-wave bands 1600 kc-30 Mc. Slide



MODEL 5X-115.
This is a new tripleconversion heterodyne
type communication
receiver. Combines
highest accuracy, stability, sensitivity; linear

tuning, constant tuning

rate, built-in 100 Kc

crystal calibrator, sensitivity less than 1 microvolt, selectable side bands, image rejection better than 60 db. band gain equalization, audio inverse feedback, and many other features. Covers nine 500 Kc segments.

3.5- 4.0 Mc 7.0- 7.5 14.0-14.5 21.0-21.5 28.0-30.0 (4 segments)

wwv

\$595.00



MODEL SX-111.
Here are the features
of this popular Hallicrafters receiver: Selectable sideband
operation; antenna
trimmer; all amateur

bands 80 through 10

meters; T-notch filter; built-in crystal calibrator; 48:1 tuning ratio. Crystal controlled second oscillator. AVC and ANL, All modes SSB, AM, CW. This unit matches HT-41 and HT-37....\$279.50

Write Uncledave W2APF with your needs and problems.

TRADE-INS ACCEPTED AND FOREIGN TRADE SOLICITED BANK FINANCING

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Insurance at no extra cost

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Over \$10,000 In Prizes

#### DOW-KEY PANEL MOUNT



Durable, silver plated, precision made. Only %1" hole is needed, no screws.

.70 ea.

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#### CONNECTORS



DOW-KEY DOUBLE-MALE CONNECTOR DKF-2

Favorite everywhere.
Precision made, rugged locking type. Silver plated.

DOW-KEY CO., Thief River Falls, Minn.

#### WHY

be without one? Get a

Memberscription NOW.

See Page 197 For Details.

#### THE WRONG AD!\*

Page 128 in October shows equipment we don't build any more. The ad should have been on the LPA-1 and the LPS-1, and page 143 of this issue gives complete data on these two equipments: the LPA-1 grounded grid amplifier and its LPS-1 power supply.

BARKER & WILLIAMSON, INC.
Canal Street & Beaver Dam Road
Bristol. Penna.

\* It was entirely QST's fault and our face is asred as our name, on the cover, QST

#### How's DX?

(Continued from page 172)

and c.w. there till next June . . . . Ohio Valley Amateur Radio Association, a lively DX group, has WSBQT, pres.; WSCSK, seey.; WSTM, treas,; and KSVDV. Ether Waves editor . . . . PYTYS intends to score Fernando de Noronha and/or Trindade QSOs this month, phone and e.w., so don't pass up PYTYS/# . . . The Gulf gang and Atlantic Coast boys took skywire maulings from unladylike ladies Carla and Esther as the '61 hurricane season got under way. The girls also soaked plenty of cellar-installed DX gear.

Ten Years Ago in "How's DX?" — The boys in the back room kick around their favorite definitions of "good conditions" to open the November 1951 column \_ . . . . Lots of goodies are available on 20 c.w.: AC3FT, C3AB, Lots of goodies are available on 20 c.w.: AC3FT, C3AB, EKIRR, ET3R, F3AT/FF, FK888 AA AL, HEIBQ, I1AHR/M1, KM6AW/KS9, L8s 5ZC 3CH, MB9BJ, MD8 2BC 2JB 2PW 2RG 5PM, MI3US, OEI38 FN RL, OQ58 AA RA VN, OY3IGO, PK4DA, SUIRX, VK1BS, VI3BES, AZ9K3N, 984s AL and AX \_ . . . . Nice stuff on 20 phone, too: HC8GI, KH6PA/KP6, PX1AR, UPs 1A 5A, VTs 3B 5GA, ZD6HJ and ZM6AA \_ . . . Forty's ablerents adhere to CT2BO, KV4AA, SV9RP, VQKIF and curious SHFI . . . Ten phone reluctanly opens up to Africa, producing EL18A, OQ5s BI NK, VQ4ERR and ZE2KH \_ . . . . Odds 'n' ends: AC4RF is said to be under arrest in Tibet for "attempted revolution" . . . . There's a vigorous new outfit down Texas way calling itself the West Gulf Division DX Club. . . USKA (Switzerland) publicises its H-22 certification . . . U.S. EKIs in Tangiers become KT1s . . . Jeeves tunes in a full-fledged menagerie, while photos of PX1A (EA8s FL and HE), the apparatus of CX1GG, and ON4RM supplement the synopsis.

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 129

#### QUEMENT INDUSTRIAL ELECTRONICS

161 W. San Fernando, San Jose, California



## WES SCHUM AMAZED AS HE VISITS "DOC", W9HJS, AT AMATEUR ELECTRONIC SUPPLY'S CHICAGO STORE



Factory? This is
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Rush more 200 V's
over here quick—
and keep them
coming."

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CENTRAL ELECTRONICS

200-V IN YOUR SHACK . ORDER NOW

## RECONDITIONED USED CENTRAL ELECTRONICS EQUIPMENT

10A Exciter	\$ 79.00
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20A Exciter	159.00
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A Slicer	29.00
B Slicer	45.00

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DOUGLAS INSTRUMENT LABORATORY

176 Norfolk Avenue

Boston 19, Mass.

#### Happenings of the Month

(Continued from page 78)

North Shores Amateur Radio Club. . . San Diego, Calif. The Opequon Radio Society of West Virginia

Martinsburg, W. Va. South Shore Amateur Wireless Ass'n . . Valley Stream, N. Y. Virginia Century Club. Norfolk, Va South Amboy Amateur Radio Ass'n. South Amboy, N. J.

During the course of the meeting, the Committee discussed, without formal action, the ICAO phonetic list, specialized columns in QST, progress on the reciprocal licensing bill, additional League official transmitting facilities, and 14-Mc. s.s.b. use.

There being no further business, the Committee adjourned, at 12:05 P.M.

JOHN HUNTOON Secretary

#### A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 41/4 by 91/2 inches in size with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner.

W1, K1 — G. L. DeGrenier, W1GKK, 109 Gallup St., North Adams, Mass.

W2, K2 - North Jersey DX Ass'n, P.O. Box 303, Bradley Beach, N. J.

W3, K3 — Jesse Bieberman, W3KT, P.O. Box 400, Bala-Cynwyd, Pa. W4, K4 — Thomas M. Moss, W4HYW, Box 20644, Munici-

pal Airport Branch, Atlanta 20, Ga. 75, K5 — Brad A. Beard, W5ADZ, P.O. Box 25172,

W6, K6 - San Diego DX Club, Box 16006, San Diego 16. Calif. W7. K7 -

- Salem Amateur Radio Club, P.O. Box 61, Salem, Oregon.

W8, K8 — Walter E. Musgrave, W8NGW, 1245 E. 187th St., Cleveland 10, Ohio.
W9, K9 — Ray P. Birren, W9MSG, 702 Spring Road,

Elmhurst, Illinois.

Wø, Kø — Alva A. Smith, WøDMA, 238 East Main St., Caledonia, Minn.
VE1 — L. J. Fader, VE1FQ, P.O. Box 663, Halifax, N. S.

VE2 — George C. Goode, VE2YA, 188 Lakeview Avenue, Point Claire, Montreal 33, Quebec.

VE3 — Leslie A. Whetham, VE3QE, 32 Sylvia Crescent, Hamilton, Ont. VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.

VE5 - Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask. VE6 - W. R. Savage, VE6EO, 833 10th St., N., Leth-

E7 — H. R. Hough, VE7HR, 1291 Simon Road, Victoria, B. C. bridge, Alta.

VES - Earl W. Smith, VESAT, P.O. Box 534, Whitehorse,

VO1 — Ernest Ash, VO1AA, P.O. Box 8, St. John's, Newf.

VO2 - Douglas B. Ritcey, Dept. of Transport, Goose Bay, Labrador.

KP4 - Joseph Gonzalez, KP4YT, Box 1061, Scn Juan, KH6 — John H. Oka, KH6DQ, P.O. Box 101, Aiea, Oahu,

Hawaii. KL7 -L7 — Alaska QSL Bureau, Box 6226, Airport Annex, Anchorage, Alaska.

KZ5 - Ralph E. Harvey, KZ5RV, Box 407, Balboa, C. Z.

#### SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1

low cost SSB, AM, CW communications receiver here.

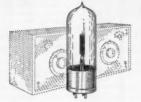
For FEATURES and PERFORMANCE see page 129

#### LAFAYETTE RADIO CORP.

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in 1906 when the vacuum tube was invented



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Belden was a quality source for electronic and electrical wire and cable back in 1902...four years before the vacuum tube became part of the American electronic scene.

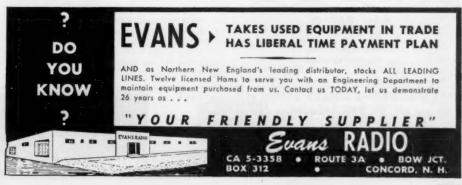
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#### HAM RADIO

can be more fun with a Memberscription. See Page 197 for Details

#### Silent Keps

IT is with deep regret that we record the passing of these amateurs:

W1JXV, Eric W. Vogeler, West Hartford, Conn. W1PBM, Wendell Rand, Waltham, Mass. K2BS, H. Ellwood Hoepfner, Buffalo, N. Y. W2COZ, Walter A. Kempf, Roselle, N. J. K2MEI, Joseph J. Krieger, Long Valley, N. J. W2YI, Harry Sadenwater, New York, N. Y W3EUL, Malcolm MacMillan, Pittsburgh, Penn. W3HEK, Walter H. Fenton, Philadelphia, Penn. W3KWN, Louis G. Fabian, Pittsburgh, Penn. W3OBL, Verne R. Voorhees, Duke Center, Penn. WA4ALM, John E. Fargis, Montgomery, Ala. W4IKZ, George W. Daughtry, jr., Bayside, Va. W4KGX, George J. Knowles, Columbia, S. C. K4SEN, S. D. Mobley, Columbus, Ga. K4YQV, George J. Yates, Greensboro, N. C. W5GAD, Albert F. Lestelle, Metairie, La. W5JFZ, William F. Cheney, Covington, La. W5KTD, Martin Colvin, Shreveport, La. K6HHA, Eugene V. Burdick, Los Angeles, Calif. W6HIP, Albert E. Gilbeau, Stockton, Calif. WA6KDH, John L. Lowrimore, Vacaville, Calif. WA6PER, Gary K. Sola, Palmdale, Calif. W7DYW, Lucile L. Broadbent, Cedar City, Utah W7LKB, Cmdr. Walter Schimmelpfennig, Bremerton, Wash. W7LOD, Jean D. Cleveland, Three Forks, Mont. W7QPB, Evan C. Parker, Hood River, Oreg. W8NLN, Roland L. Sherwood, Ashtabula, Ohio W8NPL, Frank Betts, Deford, Mich. KN9FGC, Claude Cole, Auburn, Ind. W9GCA, Ray F. Arendt, Northbrook, Ill. K9OQD, John R. Shaw, Auburn, Ill. W9QLL, Harry Johnson, Alton, Ill. W9FLF, Evrett W. Hilblink, Littleton, Colo. KN9FVN, J. Archie Zarr, Washta, Iowa

KøGNY, Jewell G. Farmer, Grimes, Iowa KNøHTM, Doyle M. Hanson, Gr.ettinger, Iowa WøMG, Russell R. Rosenkrans, Waterloo, Iowa WøRCH, Harry W. Fritz, Kansas City, Mo. KH6ANT, Eli D. Panee, Oahu, Hawaii VE28G, William A. Holtby, Iberville, Que., Canada VE3BN, H. A. Bimm, Pembroke, Ont., Canada VE3BUD, Orry R. Castrucci, Toronto, Ont., Canada

VE7NJ, Frank Putland, Victoria, B. C., Canada VE7SL, Dudley C. Schubert, Vancouver, B. C., Canada

#### FEEDBACK

Some sharp eyes have discovered a discrepancy between the upper photo on page 13 of the June issue and the circuit diagram on page 12. The photo shows the plate r.f. choke in K6SNO's linear amplifier connected to the tube side of the coax-cable section which is used as a v.h.f. bypass, while the diagram shows the choke connected to the tank-circuit side. Actually, there is little if any choice between the two connections, except that the one shown in the photo is more convenient in the layout used.

SEE IMAGINATIVE MOSLEY DESIGN of the new CM-1 low cost SSB, AM, CW communications receiver here.

For FEATURES and PERFORMANCE see page 127

#### VALLEY ELECTRONICS

713 North Jeffers, North Platte, Nebraska







### HT-37 TRANSMITTER

Features: 70-100 watts P.E.P. output CW or SSB. 17-25 watts carrier on AM phone. 5 band output thru 10. All modes CW, AM, SSB. Precision VFO. 52 ohm p network output. Idea ICW keying. Full voice control system, Idea companion exciter for HT-41 Linear. Price \$450.00.

### HT-41 LINEAR

Features: Complete coverage 80 thru 10. Adjustable pi network output. Built-in RF output meter. Built in driver pad. Standby bias. All modes SSB, AM, CW. Circuitry grounded grid class B. Can be used with any SSB exciter 20 to 100 watts. Price \$395.00.

### SX-111 RECEIVER

Features: Selectable sideband operation. T-notch filter. Antenna trimmer. All amateur bands 80 thru 10 meters. Built in crystal calibrator. Crystal controlled second oscillator. 48:1 tuning ratio. All modes SSB, AM, CW, AVC and ANL. Matches HT-37 and HT-41. Price \$279.50.



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For FEATURES and PERFORMANCE see page 129

RSE HAM SHACK

90 Selden, Detroit 1, Michigan



# THIS QSO WAS SOLID

One night . . . When the skip was perfect on 20 . . . I happened to mention the problem of saving money to an OM in 7-land . . . how hard it was to save anything from the pay check. He said he had licked the problem by banking the extra money he earned in mobile-radio maintenance.

READING OST LATER, I SAW THE LAMPKIN AD AND SURE AM GLAD I REACHED FOR THE SCISSORS. NOW MY MOBILE-RADIO WORK HAS GROWN TO WHERE . EVERY MONTH I PUT A THREE-FIGURE AMOUNT INTO THE SAVINGS

NEW . . . THE PPM METER N ACCESSORY FOR THE 105-E ACCURACY 0.0001% FOR SPLIT CHANNEL PREQUENCY CHECKS PRICE \$147.00, NET.

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LAMPKIN LABORATORIES, INC. MFG Division, Bradenton, Fla.

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CITY\_

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applies Reinforced Learning—psychological principle proved successful by Armed Forces.

uses LP records to teach you to hear signal pat-tern correctly and identify it - how to transmit.

uses identification cards to teach you the correct letter associated with each signal pattern. uses instruction book to speed your progress.

... plus an imaginary instructor (in complete and novice courses) provides correct answers to speed code learning. Many people have learned to receive 5 words per minute within ½ hours. Eliminates code plateau barrier!

code plateau barrier!

3 INDIVIDUAL (OURSES - THERE'S ONE FOR YOU COMPLETE COURSE (0-20 words per minute) — Six 10° LP records (192 minutes of recording, 28 recordings), 47 ident. cards, book #REC-020, \$15.95.

NOVICE COURSE (0-8 words per minute) — Three 10° LP records (96 minutes of recording, 28 recordings), 47 identification cards, book, #REC-08, \$9.50.

ADVANCED COURSE (9-20 words per minute) — Three 10° LP records (96 minutes of recording, 28 recordings), book, #REC-920, \$3.95.

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HQ-105-TR Recvr/Xmtr...\$219.50 HQ-145-C Recvr....\$279.00 S-100 Speaker....\$14.95

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<b>VFO-62</b>									5	4	9	. 9	15
HRO-60	T							\$	7	4	3	.0	10
NC-270	Recvi	١.	*				*	\$	2	4	9	. 9	15
NC-190	Recvi							\$	1	9	9	. 5	10
NC-270													
NC-303													
NC-400	Recvi				*			\$	8	9	5	.(	Ю

### # JOHNSON:

Messenger	ŧ	1	5	V	A	c	/1	2	٧	DC	#242-
128								0		. 51	44.95
Ranger II (V	N	ir	ed	1).				×	v.	. \$3	59.50
Valiant (Wi	re	ю	1).							. \$4	39.50
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### \* BARKER AND WILLIAMSON:

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6" Ceramic Bead Insulated Flexible Wire for HV Rectifier Tubes @ .15c each.

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14 Ga. Formvar (order #ED-14) 100'
(#\$1.89
12 Ga. Formvar (order #ED-12) 100'
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### \* TUBES:

	(New factor)	y production	on)
OA3/	VR75 @.80c	5557 /80	G-17
OB3/	/R90 @ .95c		@\$5.00
811A	@\$4.95	5763	(a \$1.75
812A	@ \$4.95	5843/4	17A
816	@\$2.50		@\$8.50
866A	@\$1.70	5847 /4	04A
872A	@\$5.75		@\$5.75
866JR	@\$2.90	6080	@ \$3.00
813	@\$13.50	6146	@\$4.25
575A	@\$15.00	6922/E	
155-	@\$5.50		@\$3.50
	8008	@\$5.75	

TUBES (unused, lab tested)
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3B28 @\$2.75 5BP4 @\$7.95
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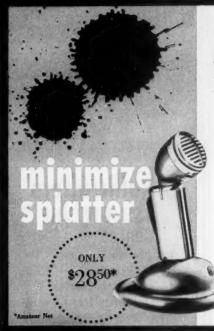
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THE VHF AMATEUR Our September issue featured an excellent conversion of the ARC-5 VFO for 6 and 2 meters which is rock-stable Edited by Dave Heller, K3HNP, it uses an entirely new concept in VFO design, Also in that Issue was "The FCC and the VHF man" by K20PI, 2 meter "Helix" by K2UYH, a new SSB column, plus our regular Moonbounce and other columns. August Issue contained a "Moiti-pol" 6 meter antenna, 100 watts—6 meter SSB, Pre-amp from TY, and more! See pictures of your buddles and late up-to-date from TY, and more! See pictures of your buddles and late up-to-date from TY, and more! See pictures of your buddles and late up-to-date K2ZSSQ. Ask to start with the August of September Issue. THE VHF AMATEUR (Dept. IIA), 67 Russell Avenue, Rahway, N. J.

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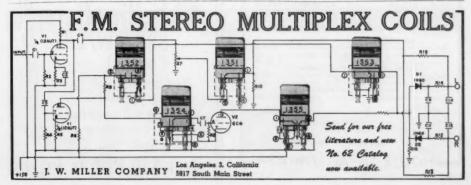
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DON'T Fail FCC tests! Check yourself with a time-tested "Sure-check Test". Novice, \$1.50; General \$1.75; Extra, \$2.00. We pay the postage. Amateur Radio Specialties, 1013 Seventh Ave., Worthington, Minn.

TRIGGER. Cash paid for ham equipment, 7361 W. North Ave., River Forest, Ill. PR 1-8616. Chicago #TU 9-6429.

TOROIDS: Uncased 88 Mhy, like new, Dollar each. Five/\$4.00 P.P. DaPaul, 309 So. Ashton, Millbrae, Calif. WANTED: Cash for surplus tech manuals, one or one hundred. State condition and equipment type. W4FXQ, Box 2513, Nortolk, Va.

WANTED: Commercially-built transceivers and QST for any months of 1922, 1923, 1939 and 1940. Al T. O'Neil, Camp Lakeview, Lake City, Minn.

SOUTHERN California: Transmitters and receivers repaired, aligned. Bandwidth, frequency, harmonics measured. Used ham sear bought, sold, traded, Robinson Electronics, 922 W. Chapman, Orange, Calif. Tel. Kellog 8-0500.

WANTED: All types of aircraft or ground radios. 17L, 618S, 388, 390, 18S, 51V, 51X2 units. Especially any item made by Collins Radio whatsoever. Also large type tubes and test equipments. For fast action write Ted Dames. W2KUW, 308 Hickory, Arlinston. N.J.

SAN Francisco and vicinity: Receivers repaired and realigned. Factory methods. Special problems invited, any equipment. Associated Electronics, 58 South P Street, Livermore, Calif. Skipper, Wok.F.

Skipper, Woak."

ATTENTION Mobileers! Leece-Neville 6 volt 100 amp. system. S50: 12 volt 60 amp system. S60: 12 volt 60 amp system. S60: 12 volt 60 amp system. S60: Herbert A. Zimmermann. Jr. K2PAT. 1907 Coney Island Ave.. Brocklyn 30. N.Y. Tel. Dewey 6-7288.

WANTED: Military or Industrial laboratory test equipment. Electronicraft, Box 399, Mt. Kisco, N.Y.

Electronicraft, Box 399, Mt. Kisco, N.Y.
WANT 1925 and earlier ham and broadcast sear for personal
collection. W4AA. Wayne Nelson. Concord, N.C.
MICHIGAN Hams! masteur supplies, standard brands. Store
Wiley Burchise Radiodor Broupides, standard brands. Store
Wiley Burchise Radiodor Broupides. Standard St., Ann Arbor,
Ham TV Equipment bought, sold, traded. Al Denson, W1BYX,
Rockville, Conn.

SELL 2 mf. G-E capacitors. 4000V DC, \$5.00 or 2 for \$9.00. Guaranteed. Dawson, 5740 Woodrow Avenue, Detroit 10, Mich.

QSLS? SWLS? WPE? Variety 25¢ (refunded). QSL samples with bible verses, 25¢. Sakkers, W8DED, Box 218, Holland. Mich.

FRITZ for QSLs that guarantee better DX returns! Samples deductible. Box 1684, Scottsdale, Ariz. (formerly of Joliet.

QSLS. Twenty exclusive designs in 3 colors. Rush \$3 for 100 or \$5 and 200 and get surprise of your life. 48-hour service. Satis-faction guaranteed. Constantine Press, Bladensburg, Md.

OSLS. Kromekote 2 & 3 colors, attractive, distinctive, dif-ferent Ball point pen with order. Samples 10¢, K2VOB Press 62 Midland Blvd., Maplewood, N. J.

QSL-SWL-WPE, Finest Since 1946. Largest assortment. Priced right. Send 106 for samples to: Glenn Print, 1103 Pine Heights Ave., Baltimore 29, Md. QSLS, "Brownie," W3CII, 3110 Lehigh, Allentown, Penna. Samples, 104; with catalogue, 254.

OSLS-SWLS. Samples 10¢. Malgo Press. Box 375 M.O., Toledo. I, Ohio.

QSLS. Best for less. Catalog 25¢ (Refundable), samples SASE. Crawford, K6GJM, Box 607, Whittier, Calif.

DELUXE QSLS. Petty, W2HAZ, Box 27, Trenton, N. J. Sam-SUPERIOR QSLS, samples 10¢. Ham Specialties. Box 3023,

CREATIVE OSL Cards. Personal attention given. Free samples and catalog. Bob Wilkins, Jr., Box 1064, Atascadero, Calif. OSLS, 3-color glossy, 100—\$4.50. Rutgers VariTyping Service. 7 Fairfield Rd., Somerset, N.J.

QSLS-SWLS, 100 2-color glossy, \$3.00; QSO file cards, \$1.00 per 100. Samples, 10¢, Rusprint, Box 7507, Kansas City 16, Mo. PICTURE QSLs. Cards of your shack, home, etc., Made from your photograph, 1000, \$13.00. Raum's, 4154 Fifth St., Philadelphia 40, Penna.

OSLS, 300 for \$3.95, Samples 10¢, W9SKR, "George" Vesely, Rtc. \$1, 100 Wilson Road, Ingleside, Ill.

OSLS, SWLs, XYL-OMs (sample assortment approximately 9/4θ) covering designing, planning, printing, arranging, mailing; eye-catching, comic, seedate, fantabulous, DX-attracting, protypal, snazzy, unparagoned cards (Wow!). Rogers, KθAAB, 961 Arcade St., St. Paul 6. Minn.

OSLS-SWLS. Samples free, W4BKT Press, 123 Main, McKen-zie, Tenn.

The Tenn.

11/2" Call QSLs (2 sides printed), 100, \$2.75; samples free.

Gariepy, 2624 Kroemer, Ft. Wayne, Ind.

QSLS, Samples free. Phillips, W7HRG, 1708 Bridge St.,

The Dalles, Oregon.

OSLS, Samples dime, Rubber stamps: name, call and address \$1.35. Harry Sims. 3227 Missouri Ave., St. Louis 18, Mo. OSL: samples 25¢ (refundable), Schuch, W6CMN, Wildcat Press, 6707 Beck Ave., North Hollywood, Calif. OSLS, \$2.50 and up. Samples 10¢. RBL Print M.R. 12, Phillipsburg, N.J.

Samples 10¢. W7IIZ, Wines, Box 183, Springfield,

OSLS, SWL's that are different, colored, embossed card stock, and "Kromekote". Samples 10¢. Home Print. 2416 Elmo, Hamilton. Ohio.

OSL's 100 glossy 4 color \$3.70 Postpaid. Samples 10¢, or send 25¢ for large assortment and free "Danger, High Voltage" sign. Dick, W8VXK, Rt. 1. Gladwin, Michigan.

RUBBER Stamps for hams, sample impressions, Hamm, W9UNY, 542 North 93, Milwaukee, Wis.

HUNDREDS QSLS: 80c, Meininger, Jesup, Iowa. Samples DON'T Buy QSLS-SWLs until you see my free samples. Bolles, 7701 Tisdale, Austin. Texas.

QSL'S. Real eyecatchers. Dime. Filmcrafters, Box 304, Martins Ferry, Ohio.

QSLS-SWLS Free Samples, David Spicer, 4615 Rosedale, Austin 5, Texas.

QSLs. Samples. Dime. Printer, Corwith, Iowa.

OSLS, SWLS. samples 56. Nicholas & Son Printer, P.O. Box 11184, Phoenix 17, Ariz. QSLS. Stamp and call brings samples. Eddie Scott, W3CSX, Fairplay, Md.

OUALITY OSL's. New designs, samples 10¢. Giant, 25¢. Savory, 172 Roosevelt Rd.. Weymouth. Mass. OSLS. Large selection styles, including photos, Lowest prices. Fast service. Samples dime. Ray, K7HLR, 679 Borah, Twin Falls. Idaho.

RUBBER Stamps, \$1.00 Call and Address, Clint's Radio, W2UDO, 32 Cumberland Ave., Verona, N. J.

CANADIANS! QSLs in fluorescent colors, by silk screen process, Free samples, Martin, 8 Kensington St., Woodstock, Ont.

Canada: BETTER Than anything you have seen: Craftsman-built British communication receivers. Eddystone Mod, 888A for ham band only: other models for seneral coverage from \$115 to \$1270. See sheets from Maurice, VE3CZG, Top Television Service, Ltd., Elliot Lake, Ont., Canada.

CANADA: 75S-1 for sale, in mint condx, engineer-owned with Drake 2AQ multiplier/spkr. Includes new spare each tube type, ijrst \$500 takes lot. H. M. Smith, P.O. Box 578, Sackville, N.B.,

WANTED: Collins 13C-1 Crystal Box for KWM-1, state price and condx. VE2ADH 11875 Guertin St., Montreal 9, P.Q., Can. CANADIANS: KWM-1, AC, DC, Mobile Mount for sale or trade on KWM-2. Cash difference. VE5DG, 1421 Retallack, Regina, Sask.P., Canada.

Regina, Sask.P., Canada.

SELLING: One AT7 transmitter, three 110V, 60 cycle selsyns, several 400 cycle selsyns, other parts. Stamp for list. VE3ABL, 1256 Foxbar Avc., Ottawa 1, Ont., Canada.

SSBers! Keep up with SSB news and views! Join the Single Sideband Amateur Radio Association, dedicated to furthering good SSB operating; promoting advancement of SSB equipments and disseminating SSB technical information. Read "The Sidebander", official publication of the SSBARA, Dues 37-yearly. Write for membership application sample: "Sidebander", 10 SBARA Membership, 1385 Richmond Court, East Meadow, N. Y.

CHICAGOLAND Amateurs! Factory authorized service for Hal-licrafters. Hammarlund. Globe, Gonset. Service all amateur equipment to factory standards. Heights Electronics. Inc., 1145 Halstead St., Chicago Heights. Ill. Tel. SKyline 5-4056.

COMPLETE Service—Transmitters and receivers. QSLS reasonable. KØDGX, Keith, 601 E. 4th St., So. Newton, Iowa. adde. ADDGX, Keith, 601 E. 4th St., So. Newton. Iowa. A-5 one inch Vidicon deflection components. 5 piece model Vk-100 tube type or transformer type kit; Has deflection yoke, focus coil, alignment coil, horizontal and vertical output transformers. 599.00 net. Also 3-piece model Vk-200 direct drive or transistorized kit; has deflection yoke, focus coil and alignment coil. \$89 net. Components available only as above kits. Send check or money order. Io days unused-undamaged return privalege. Gleveland Electronics. Inc., Deflection Components Div., 1974 E. 61st St., Cleveland 3, Ohio.

HT-37 Demonstrator, \$365; Drake 2B demonstrator, \$225. First certified check takes freight collect, Always lowest prices. \$ASE for lowest quotation on your needs. H D H Sales Co., P. O. Box 73, Rowazion, Conn.

COLLINS S/Line for sale: 308-1, brand new, factory sealed: 328-1 with supply, used 5 hours; 758-1 with C-B xtals, used 4 weeks; E-V good microphone, used 5 hours, All: \$2250 40, F.o.b. Radio KP4HH, Box 5124, Puerta de Tierra Sta., Puerta de Tierra Puerto Rico.

WANTED: OSTs for personal collection; January through September, 1916. WICUT, Box 1, West Hartford 7, Conn.

KITS Professionally wired. Half factory charges: others. 25 percent plus shipping. Garrahan, W3QZ, 1445 1/2 Wyoming, Forty Fort, Penna.

CASH For your gear! We buy, trade and sell. We stock Hammarlund, Hallicrafters, National, Johnson, RME. Hy-Gain, Moseley and many other lines of ham gear. Ask for used equipment list, H & H Electronic Supply, Inc., 506-510 Kishwaukee St., Rockford, III.

SALE: Collins 30S-1 linear amplifier, brand new, In perf. condx, Never used! Best offer. No shippins, sry! W2NBZ. WANTED: 6 to 12. 304TL tubes. Callanan, W9AU, P.O. Box 155, Barrington, Ill.

SELL: Used 200V. Like new, \$639.00. Organs and Electronics, Lockport, Ill.

AF67 wanted. WA2DCA.

SP-600 1X26 Hammarlund revr. \$4-54 Mc., \$295.00; SP-600 1X-17, \$395; HRO-60, \$299.00; 7552, \$499.00; Collins 5112, S130, A, etc. Teletype Kleinschmidt printers. RTIY converters. Alltronics-Howard Co., P.O. Box 19, Boston 1, Mass. Tel. RIchmond 2-0048.

WANTED: Urgent R390A receiver. All offers considered. For sale: complete AF67, PMR-6, mike, Johnson ani. coax relay, cables. Price \$200. Also Gonset 49-50 Mc FM rec. w/power and spkr unit (mobile) 12 volt. \$50. Mr. Pfeiffer, RO 1-0657, 30 Miller Terrace, White Plains, N.Y.

RANGER, Factory wired, ser. #61100, all new tubes, \$200. K6JKP, John Knight, 1122 7th, Sacramento, Calif.

TAPETONE Converters 50 and 144 Mc (never used), \$60 each; a'so 40 and 108 Mc, converters for satellites, \$45.00 each; 417A input tube in 108 and 144 units, 411 14 Mc, output, Regulated power supply, \$35.00. Will consider package offer, F.o.b. W20TT.

ALL In mint condx, new Wollensak T-1500 tape recorder, \$140.00: Victor 60-10 16 mm sound projector, \$250: Hallicrafters 039/TRA7 frequency shift exciter, \$100: teletype printer TT-55, \$100. Zeb DeVille, K5ISY, \$225 Edward Ave., Alexandria, La. FREO. Meter BC221-T. \$30: BC625. 2 mirs. \$10: ARC-5 revrs. \$2-1.5 Mcs. \$8: 3-6 Mcs. \$8: 19-55 Mcs. \$10: parts for rower sunply 0-30 VDC. 20 amps. \$90; SW-3. \$15: BC-1306. \$15. Heath tube checker. TC-2, \$20: L-177. \$15 inc. postage of railway express coil. W2QND, 176 Winding Way So., Little Silver, N.J.

KWM-2 and AC supply, in new condx. Late serial. Guaranteed. \$1050.00. Alton Culver, 530 Elizabeth Rd., San Antonio 9,

SELL: HQ-110C in perf. condx. Includes built-in clock and matching spkr. \$180.00. Heath VF-1, \$10; Gotham V-80 (never used), \$12. Peter Lewis, 111 Dayl Drive, Kensington, Conn.

MOSLEY V-4-6 vertical, used 4 months, complete with 80M base loading coil, guys, blitz-bug, approx, 100 ft. RG/8U and connectors; cost \$65. Sell for \$38.00. Will ship. W5HSO, Box 307, Belen. New Mexico.

KWS-1, \$900. SP-600, \$200. W2ADD.

GOING SSB, 32V2, spare 4D32 and 807s, \$250. Exc. condx. K9UFV, 501 McKinley, Libertyville, Ill.

COLLINS 30S1 linear amplifier. Used less than twenty (20) hours, perfect in every respect. For quick sales will sacrifice, in orig. carton, \$875. F.o.b. Nashvilie. James O. Pugh, W4GXX, 409 Donelson Pk., Nashville 14, Tenn.

HAMS Vicinity Arcadia, Calif. Sold place S.O.S. for trade F.O.B. backyard at 123 Santa Cruz Rd., Arcadia. One new, cresoted and painted fully rigsed 79 ft. cedar pole on the fore Feb. 1962 for one 60 ft. crank-up tower f.o.b. as is. Clear easy access to pole. Write R. S. Cole at 216½ 43rd St., Manhattan Beach, Calif.

SELL: Excellent Harvey-Wells TBS-50-C, matching APS-50 power supply, VFO, mike, \$75.00. Contact: K9OMO, \$21 Alden power supply, VFO Rd., Muncie, Ind.

THUNDERBOLT, \$465.00: Pacemaker, \$275 latest, 4N, F/W, Gonset 500W linear, \$125.00, 4N W2DTD, 29 Charles St., Merrick, N.Y.

WANTED: Operating manual for R.C.P. tester Model 411. Hal Rawlette, W6UVW, 4120 Cabinet Circle, North Highlands, Calif.

HROSTA1, PS, spkr, bandspread coils, mint condx, \$150: BC348, AC, \$55: Wilcox CW3, 5.6-10 Mc coils, \$30: P&H AFC-2, new condx, \$35.00: Nat. CFG 199/RC 105 P&H supply, \$15: Collins cabinet, 32V series, \$12: D-104 w/stand \$15: Vibroplex Oris. Deluxe, new, \$15: Knight sweep senerator, \$25: Lynmar 178. \$5. K2MRU, \$56 Wittich Terr.. \$120: Lynmar 180: Lynmar

WHEVEY Valle, N.J. 1et. EA F-2166.

UHF-VHF Men! Lavoje precision wavemeter, 375-725 Mc., extremely accurate, used, excellent, \$20: Philico precision wavemeter, new, accurate, 145-235 MC., \$12: both instruments checked recently against Boonton standard. Both have silvert-polated cavities, complete with wiring diagrams, calib. Chars, spare tubes and batteries. Eleo model 324 signal generator, new, wired and calibrated, with instruction book. \$27. Express charges collect. W3CLP.

FOR Sale: General Radio 1211-B unit power oscillator .5-50 Mc and matched regulated power supply GR 1201-B. Both in new condition, hardly used, Best offer over \$175.00. Orig. cost \$350.00. Mail only. Brock 2226. E. 28th St. Brooklyn 20. N.Y. SALE: Complete station of DX-100, SX-28, bug, Morrow Conclad Monitor, keys, mike, dummy load, baluns, metal table, clock, spkrs, chair, and all cabling. Everything rebuilt to match. Works good, won't ship, 600 lbs, \$425.00, WIVKY.

WORKS good, won't ship, 600 lbs, \$425.00, WIVKY. VIKING Ranger and HO-140-XA for sale. Both excellent condx, perf, mechanically and electrically. Ranger, factory-wired and tested, complete with instrux, manual, orig, sales slip and shipping box. HQ-140-XA complete with spkr, XC-100 calibrator, instruction manual and orig, sales slip. Prices \$185 and \$160 respectively. Larry Guenther, W9ACS, 315 Dempster, Evanaton, Ili. Phone UN 9-4421.

WANTED: Jennings variable vacuum condenser UCS 10-300 or 10-400 mmf. 10KV or 15KV, WØBFB, Mitchellville, Iowa. SELL: HT-33A, \$495. F.o.b. Bill Fiscus, One Maiden Lanc. Lynnfield, Mass.

75A3, 3 kc. mechanical filter, spkr, vernier knob, mint condx, 3350.00. Deliver 100 mile radius, K1TIB, 25 Hickory, Holyoke, Mass.

FOR Sale: Collins equipment, all changes to date made: in perf. condx: KWS-1. \$975; 75A4 with spkr, \$575; KWM-1 with spkr and pwr. supp. \$885; KWM-1 mobile mount, unused, \$45; new 12VDC mobile pwr. supp. \$16E1, \$195; latest Central Electronics MM2 with 455 Kc adapter, \$90: Halt-crafters SR-34 AC-DC 2 and 6 transmitter/receiver, \$290; Globe 6 and 2 VFO. \$48; pair 4-250A Elimacs. ors. cartons. \$38, pair United \$38s, \$8. E. O. O'Brien, \$6-10 34 Ave., Jackson Heights, 72, L.1, N.Y.

WANTED: Heathkit KS-1 power supply. Please state condition and price. K1LMJ. Bineau, P.O. Box 427, Lisbon, Me.

ART-13, 210 watts, with antenna coupler and power supply, 80-40-20 meters, TVI suppressed, \$145 or trade, For details: KØMUK, 457 Yorkshire Place, St. Louis 19, Mo.

KOMON. 437 JOEKSHITE Place. 31. LOUIS 127, 1910.
KWM-1 with Collins AC pwr. supply, wattmeter in speaker console. Excellent physical and electrical condition. Never operated mobile. In original cartons with instruction books. All modifications done at factory. Cash and carry. \$600. Capt. David Shoup. OMR 672, Keesler AFB. Mississippi.

FOR Sale: HO170C, perf, on all bands, no modifications, no scratches, \$270.00. F.o.b. K51PK.
FOR Sale: New and used items. Beam antenna, xmtrs, tubes, manuals. Send stamp for list. Wanted; Used revr. \$35 or less Sam Kofsky, W2YSF, 201 Eastern Phwy, Brooklyn 38.

N. I. SELL: DKC-TRP TR switch, self-contained power supply, instructions, original carton. Best offer, Write George Sucich. WA2JHN, 6000 Tyler Place, West New York, N.J.

WAZINN, 6000 191er Place, West New York, N.J.

MUST Legve amateur radio. All equipment in excellent condition. Will ship C.o.d. except transmitter. Globe-King 500A (late serial number) with Elenco voice-power gainer attached. \$279; Johnson KW Matchbox. \$65; multiphase RF analyzer. \$65; D-109 microphone with stand, \$16; Knight 50 w. transmitter with screen modulator, \$29; Knight VFO, \$18; United Williams (S.) Standard, \$25; Volkolmmeter, Simpson mod. 260, \$25; Kockwille, Md. F. Gordon M. Dunning, \$60 Woodburn Rd. Rockwille, Md.

KWM-2 with AC power supply, in mint condx, \$950. Ship freight collect. W8DRN. 2554 Lafayette, Cleveland 18, Ohio. BEGINNERS: Code bothering you? Now learned in one hour, New Method. Quick approach toward ham ticket. Used in armed services, ham radio, scouting, "Ketchum's Hour Code Course", \$1.00 postpaid. Guaranteed. Oaks Ketchum, 10125 Flora Vista. Bellflower, Calif.

WANTED KWM-1 complete. Send description and best price to W20BH. 200-27 46 Avc., Bayside 61, L.I., N.Y. SALE: 75A Serial #3200, \$475: HT-37, \$360: MM-2 scope, \$90: all in like-new condx. Ship C.o.d. for certified check or money order Orig. cartons. Dr. J. R. Perciful, Medical Arts Bldg., Louisville 17, Ky. GL 2-2116.

Communicator IV, Set 22110.

Onan 115V, 60 cycle power plant, asking \$200. WA2EFO, George Mowbray, 14 Washburn Rd., Mt. Kisco, N.Y. 914-MO 6-8507.

GLOBE SCOUT 680A, \$75: Heathkit VF-1, \$15: Hallicrafters S-38D, \$25.00; RME-99, \$50. L. C. McCall, W4GCD, 614 Valley Drive, Dalton, Ga.

75S-1 with F1-1 500 cycle filter for c.w. \$425.. L. A. Morrow, WIVG, 99 Bentwood Road, West Hartford 7, Conn. ADams 2-2073.

BOLEX H/8 Deluxe with three f/1.9 lenses, Surefire grip, filters, English leather case, etc. All in like-new condx. Will swap or sell for Gonset G-76 or Collins KWM-1 mobile gear. William Garrett. 1021 E. Scottwood Ave., Flint 7, Mich. Tel. CE 3-6449. WANTED: Amplex KW-62 6 and 2 meter amplifier, with or without tubes and power supply. Also W4IMP "IMP" low power version. Please write Box 55-7574, Gregory, K4OLK, Miami, Florida.

C-W crystals. Marine. Amateur, etc. See our previous ads. Box 2065Q. El Monte, Calif.

DESIRE KWM-1 at best price. Bob Foss, 54 Bald Mountain Drive, Bansor, Me.

MUST Sell DX-100; SX-101 Mark III, perfect, \$295.00. WA2-QEK, Brooklyn, N.Y. Tel. DI 5-2020. A. Wm. Friedberg. WANTED: Gracie says I need another transmitter like I need another hole in my head, but if you've got a good clean KWM-1 et the know your best price. Larry Kleber, W9CPD/K9LKA, 922 Whitney Blvd., Belvidere, III.

SELL: SX-111. R48, best offer \$225 or over. Will ship. Wayne J. Schmidt. 1009 South Main, Aberdeen. South Dakota.

VALIANT: In fine shape: \$250.00; HY170C. 3 months, perfect. \$10; Apache, fine shape: \$250.00; HY170C. 3 months, perfect. Monitone, \$12; Eldico SSB-1000 linear. 2 space 4X250B tubes. \$200. Wanted: KWM-2 or Gonset G-76 transceiver, or cash. Jerry, K40RP.

Montione, \$122, Edited S58-1000 linear, 2 states, 2 states, 200. Wanted: kWM-2 or Gonset G-76 transceiver, or eash. Jerry, \$40R.?

5200. Wanted: kWM-2 or Gonset G-76 transceiver, or eash. Jerry, \$40R.?

524, \$478.4 serial 38-58, perfect, \$490; 0.5 Kc mech, filter, \$40; 2 KW custom-built 4-400A final, illuminated meters, built-in 3750 yIDC montions and the states of the states o

FOR Sale: SX-100 with speaker, in new condx, used 20 hours, In orig, carton, \$200. H. L. Allen, Jr., P.O. Box 248, Elton, La. COMPLETE Mobile station: Elma AF-67, Gonset Supersix, Carter 6v. supply, all-band antenna, mount, Shure microphone, all fittings and relays. Best offer over \$195, K2SIF, 70 Long-fellow Rd., Great Neck, L.I., N.Y

OSTS run: 1954-59. Swap or sell F.o.b. Nat Stinnette, Umatilla,

COLLINS 51J-4 Ser. 1923 with three filters, perf. condx. \$1100. E. Vilagi. W8BBA, 502 Sixth St., Farmorr Harbor, Ohio, FOR Sale: Eico Mod. AT-1, Bud. Lo-pass, xtal calibrator, mobile rig, and more. Write for free list and prices. S. Bomba, 107F Eagle Heights, Madison, Ws.

K31CP Selling out: Viking 500, factory wired, one year old, \$500; Ray Borders, Radio Electric Service Co., 3rd & Tatnali, Wilmington, Del.

SELL: Transmitter, 350 watt input, 'phone, c.w., complete ex-cept for speech amplifier. Home built. Real bargain. cash and carry. W3KAB, 213 Newtown St. Rd., Newtown Square, Penna. Telephone Elgin 6-0681.

SELLING HQ-145C w/cal., \$230.00; Ranger w/PTT, \$190, like new condx. Mosley 40-10 M vertical w/radials, \$25. K9OFK. FACTORY Wired CE20A, QT1 and BC348. Drake 1A WWV and calibrator. Both in like new condx. Make offer. Am interested in tape recorder and compact KW linear or Class C final. W8ZBD, 1605 Iowa, Midland, Mich.

ELDICO SBA-I Sideband Adaptor with xtal-lattice filter, O-multiplier, I. F. noise limiter, adj. AVC S-meter, will drive spkr. New, in original box w/manual, \$200.00. W2LAH, Box 42, Setauket, L.I., N.Y.

JOHNSON Ranger, brand new condx, \$150.00. Come & get it, W2HO Mountain Rd., Monroe, N.Y.

COMPUTER Amplifiers for parts, less tubes, 4" x 5" x 15" case, with handle, \$4, Box 7, Cambridge 39, Mass.

GOING Mobile, Will sell HQ-160. \$275; Valiant, \$300; Johnson 6N2, \$100; Johnson 6-2 converter, \$40; Heath VFO rewired for 6, \$25; all in exc condx. Sell individually or as unit for \$600. K7t,Q1, 11557 Evanston Ave., N., Seattle, Wn.

MECHANICAL Filters: I have just purchased 200 surplus units which contain 300 Kc mechanical filter 4 slug tuned Hi-Q coils. BFO coil, over 75 half-watt resisters, 10 silver micas. 200 ceramics circuit of filter included. \$12.50 each, postpaid. W. R. Selden 4021 West Broad St., Richmond, Va.

HQ-170 with Deluxe matching spkr. In fine condition. \$279, H. Lester, W2ODC, Box 6, Alpaus, N.Y.

SELL, Swap Heath Mohican factory check-out. Want SB10 or mobile, all-band transmitter. New York area, WA2OZV, Dav-enport 575 E. 168th St., Bronx 56, N.Y.

LETTINE 242 6M transmitter with VFO, \$75: BC-348R with homebrew power supply, \$30: Sixer modified 8 Mc. xtals, \$30. Want 6N2 transmitter with or without VFO, Jack Didwell, WA2KXN, 50 Pine \$t., Brooklyn, N.Y. TA 7-9160.

QST run, May 1929 through December 1945 for sale. October and November 1931 issues missing, Make offer C. F. Stafford, W2AAU, 85 Coolidge Ave., Spencerport, N.Y.

SELL: Collins 75SI with 500 cps filter and Sidetone crystal. 32SI, 516F2, 312B4. All latest factory modifications, perf. condx. Orig. factory cartons, instruction books, feet offer 71200, 41000. amount of 71000. The factory cartons, instruction books, feet offer 71200, 41000. The factor of 71200 collins of 71000 collins of 7100

Blutts, Iowa.

COLLINS 30S-1 linear, excellent, \$1050; Westinghouse 6kv 1 mfd, filter capacitors, \$15 pair; 4-125A, \$5.00. F.o.b.Winnebago, Ill. D. Mitchell, R1 B 59.

SEND For flyers listing transmitters, receivers, teletype converters, tubes, components. Spera Electronics, 37-10, 33rd St., L1C. N.V.

L.I.C., N.Y.
MASCO Super Sky-Chief TV booster, \$20; meters: RF milliam-pere, \$7; HF amperes 0-1.5 BC-442A ant. relay unit, \$5.00. At-water-Kent spkr. Type N (antique), Collins spkr 312-A-1, \$25.00, F.o.b, WITHM.

For No. WITHM.

FOR Sale: Unbound QSTs. 1948, 1949, exc., \$4.00 year; meters: Weston Mod. 301, 100us. 200us. 10 ms., 25 ms. \$4.00 ex.; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 153; VU. \$5.00; Model 1521, 20us. \$4.00; Triplett Model 261, 20us. \$4.00; Tr

FOR Sale: DX-40 transmitter, \$40.00. Jim Wilson, 204 Prather Hall, Austin 18, Texas.

MUST Sell, Going to college, Globe Scout 680, \$50; NC-98, \$95; AR-22 rotor, \$15, All in FB condx. Write K. Rygler, K2PPU, 147-09 76 Ave., Flushins, L. L., N.Y. XTALS for sale cheap: 7048, 7056, 7166, 7175, 21153, James Hampton, 1010 Booth, Dubuque, Iowa.

SELL: DX-40, perfect, \$45.00. D-104, \$12.00. Joe, K3CQY, Roseto, Penna SFI.L: 2,4-400A's at \$15 ea. 2, 813s, at \$5 each. Used, good. WILWV.

WILLW.
FOR Sale: New SX101A in factory carton, \$325.60; new professionally wired Heath HW-30 transceiver, \$50; new Hy-Gain 2-meter beam, \$14.95 list, sell for \$8.00. Good used Navy LM freq, meter with AC power supply, \$40. All with manuals. W4-TAI, 229 Seaview Ave., Daytona Beach, Fla.
FOR Sale: HT-33A, 'perfect with new PL172, all latest factory modifications for 2 Kw, PEP in ABI, Will consider trade for latest model Viking Ranger FW, S. Lucich, 3809 Lakeview Rd.. North Little Rock, Ark. W5NKE.
GATES Sta-Level compressor amplifier: Morrow 5BRI.

GATES Sta-Level compressor amplifier: Morrow 5BR1. allband converter with noise limiter: SCR-522 transmitter with new RF tubes: BC433 85 kc. IF coils: PEI034 6-12v dynamotor: 6 volt coaxial relay: mobile antenna mount: OST issues from 1948. Sell for best cash offer. E. Pyle, KIOKK, 120 Appleton St., Cambridge 38, Mass.

ton St., Cambridge 38, Mass.

FOR Saje: Custom-made ceramic ash 'ray (green, brown o-white), Your handle and call letters in gold, \$5.00. Choctaw Challenger (Francis, KSZTH, Jim, RR I, Box 14K, Choctaw, Oklahoma. WANTED: Coll G (180-430 kc) for National HRO Series 'recyr, J. R, White, WZWBI, 118 Cedar Lane, Princeton, N.J. WILL Trade 1960 Mercury 700 outboard and 1960 Thompson 17 ft, Sea Lancer with coupe top, side curtains, rear cover, full length cover, rear seat, de luxe cushions, tachometer, speedometre, ctc. like new, total 38 hours use since new last July, Will trade for S Line equipment or equivalent. No duty payable on merchandise returning to USA, Write VEZCO, 36 Birch Hill Road, Baie d'Urle, Montreal, Que, P., Canada, Phone GLendale 3-65-42.

3-6542.

HEATH HW2O Pawnee, complete, Excellent, Latest modifications. Sacrifice at \$225, for quick sale, Telrex 8-cl. 2M beam, New, in carton, \$12.00, Phelps, WA2BPL, 6 Edwards St., Apt. SELL: Like new, 2 mir. Tecraft converter, \$25: 130-walt 2 mir. statistics, 135.00; Conset noise silencer, \$3.50 ½ kw final and sup-Nittley, N.J., NO 7-7552.

SELL: Station package: factory-wired Valiant: SX-100, mike, relay, 3 dipole antennas: assorted valuable junk. All in mint condx, with original crates. \$500.00. WA2AZF, 1 Barnes Ave., Baldwin, N.Y.

FOR Sale: Globe Chief Deluxe, in exc. condx, \$55.00. Will pay shipping anywhere in U.S.A. Jim Rhein, P.O. Box 142, Jones-boro, Tenn.

FOR Sale: 32S-1. #2918, 75S-1 #2555, \$825: HT-37, \$375; GSB-101, \$265; B&W L-1001-A, with tubes, \$225. Transformer, 220,3800 VCT at 2.7 amps, \$50. Eimac 4-65-A, new, 55. James Craig. 72 East Sixth, Peru, Ind. Tel. GR 3-9306.

SELL: For best offer, Proceedings of IRE, run 1951 thru 1960. In exc. condx. F.o.b. Winston-Salem, W4DSM.

WANTED: Commercial or surplus aviation and ground trans-mitters, receivers, test sets, 18S, 17L, 51R, 618S, GRC, PRC, ARN14, MN85, Bendix, Collins, others, RITCO, Box 156, Annandale, Va.

DX-20 Manual 3L Gotham 20 m. beam. \$25.00 each. K4TQZ, 3917 Michigan Drive, Louisville, Ky.

WILL Trade RCA 5820 image orthicon television pickup tube for good receiver or SSB transmitter or two 4-1000A tubes. Vern Slagie, 1704 Hale, Ft. Wayne, Ind.

FOR Sale: HT-37, \$365: HO160, \$275; both like new, Heath reflected pwr, mtr., \$10: Eldico simal tracer, \$20: TCS-14 xmtr and pwr, supp., \$50: Meissner free, std., \$20: manuals. F.o.b. Roseville. Calif. Merle Es.sn, \$10 Fremont Ave.
FOR Sale: Collins 312B2 spkr, wattmeter, console, for use with KM-1. Special, \$95. F.o.b. N.Y. Can also be used with \$2S1. Jack H. Garretson, W2AOM, 1235 E. 40:h St., Brooklyn 10, N.Y. Tcl. DE 8-4645.

SELL: Johnson Thunderbolt \$425.00; HT32, \$425.00; SX101 revr., \$225. All in new condx. Will sell complete station w accessories. Write for details. K25J/8, 4058 Herman Ave., S.W., Grand Rapids 8, Mich.

SELL: HT33A, 600D mobile mike, JT30 mike, pair 4CX300 tubes with sockets, W9MZP, 7055 Cleveland, Niles 48, III. tubes with sockets, W9MZP, 7055 Cleveland, Niles 48, III, KOOL KW fmail; PP 4-250A, Class AB-1 or Class C; 2000/2500V at 600 Ma, sep, screen and grid supplies and separate meters for plate, screen and grid; plugin coils, plate and grid, for 15,20,40 meters; built into HT-4 case (same shape and size as BC-610); steed doily with HT-4 case (same shape and size as BC-610); steed doily with castors, Sry, cannot ship, \$175,00 or your best reasonable offer. Write: Fred Westervelt, W4NO, 1708, Fssex Rd., Charlottesville, Va.

TRADE: Rolleiflex 2½ x 2½ model 2.8D with case. Brand new, Newer used. Want: Late model Communications revr. All letters answered. Donald Farrell. Chittenango. N.Y.

CRYSTALS: 80-2 meters, 25e each. Guaranteed! Send for list of frequencies. Stancor power transformer 1200VCT at 200 Ma., plus filament windinas. \$4.75 each, plus postatae. WelMC, 210 Alden Rd., Hawward. Calle.

FROM Estate: 75A4. #5149, \$575, 75A4. #2316, \$500; 312A-1, \$100; \$1

DX-100 needs output loading condenser modification kit. \$150 or best offer. George O'Donoghue, Patricia Ave., Fishkill, N.Y. 5113, 4, R388/U wanted, trade HT-37 and cash to fair market value. Send details. KØSBS, Omaha, Nebraska.

GONSET Super Six, \$20.00: James C-1050, \$20.00; Mobile whip with 40-meter coil, \$10. WØEUQ, 901 13 Ave. S., Grand Forks,

KWM2 Serial #11612 and 516F2 power supply. Used less than 25 hours. R. J. McMahan, K3KSM, 15 Thackeray Road, Welles-ley, Mass.

HEATH Apache with S-200 mike; Heath Conelrad alarm, \$199; Hallicrafters SX-101A, like new, with R48 spkr. \$330.00 WI-UYU, 495 Water St., Framingham, Mass, Tel. TR 2-8628.

HIGHLY Effective home-study review for FCC commercial phone exams. Free literature. Wallace Cook, Box 10634, Jackson, Miss.

Jackson. Miss.

COLLINS 75A4 with 800 cvl. filter Ser. 4964. KWSI, Ser. 1164, S1500. In mint condx. K8EJY. 1508 Constance Ave., Dayton 9, Ohio. Pick up deal. Sry. no shippins.

DX-35. excellent, 3 Noviec xtals. inst. manual. \$39: FM-40X. FM-175X mobile FM units. mike. control boxes, most connecting cables: NRI multiteater, needs work but includes all necessary manuals. Quotes? K1PVI. 3 Old South Lane, Andover, SSE Comments.

Mass.
SALE or swap: Ranger, \$185; Viking 6N2 with VFO and cables for Ranger, \$115; Gonset II. 2 mtr., \$200; Gonset, 1 6-6 Mc. converter, \$18. Want: SSB gear, Valiant Model 15. KINGJ. E. Norton, 22 No. Liberty. Nantucket, Mass.
COLLINS 305-1 linear, like new, used only few hours, \$1175 Will ship prepaid airfreight, Howard Winner, W45WY, 9100 S.W. 61 Court, Miami 56. Florida, Tel. Mohawk 7-3127.
SALE: 600 watts fixed and portable station. 813s final. 805s modulator, two mercury VAP. HI-Voltage rectifiers one hi-vacuum, lo-voltage rectifiers mounted in a 6 ft. rack, speech clipper, annuffier. Elmac Af-34H with Ac and Dynamotor James Murray, K3QAW, 217 N. Poplar St. Elizabethtown. Penna.

FOR Sale: NC-300, \$200; DX-100, \$125.00; BC312, \$40, Heath Conelrad, \$8, Cleaning out hamshack, Write for list, Frank, K9BGF, 2421 K, St., Bedford, Ind.
HQ-140X, 3 el, Tribander, both with accessories, other equipment. Old QSTs (50-59). Call WE 5-9367, Dick Stein, K2OPJ, 15 Parkway Drive, Syosset, L.I., N.Y.
MATCHBOX, Monomatch, w/meter, \$45.00; HQ-1107, w/

15 Farkway Drive, Syosokt, L.L., N.T.
MATCHBOX. Monomatch. w/meter, \$45.00; HO-110C, w/
clock, spkr. manual and factory carton, \$185.00, KØ/YYV, "Jud"
Schandel. Blue Earth, Minn.
SELL: HO-160, \$260; Apache transmitter, \$239.00; Knight 50
watt transmitter, \$29.00, K9UKJ, 7205 S. Euclid, Chicago 49,
Ill. Tel. FAiriax 4-9174.

Ill.. Tel. FAirfax 4-9174.

SALE: DX-40 with mic. \$59; SX-96, very clean, \$150.00, Roy Welter, KoCNI, RFD 2. Olivia, Minn.

HT-32, completely factory serviced and Courier, factory-wired both suaranteed in gud condx. First \$450.00 check. R. B. Cooper, W8AQA, 132 Guild St., Grand Rapids, Michigan.

S-107, not used over ten hours. S78; AR-3 case, O-multiplier in A-1 shape, \$38, or your best offer. Lindsey Coleman, Box 391, WANTED: KWM-2 transceivers and any old issues of QST from inception through 1925. Al T. O'Neil, Camp Lakeview, Lake City. Minn.

FLECTRONIC Kits wired and tested. Fingst multiplier.

Lake City. Minn.

ELECTRONIC Kits wired and tested. Finest quality workmanship. Hammond, K6HWE, 1533 D Avenue Northeast, Cedar
Rapids, Iowa.

COLLINS 32S-1, 75S-1, 516F-2, perfect condition, \$800 or complete station including TA-33 Tribander, AR-22 rotator, Hallicrafters spkr, Jap dynamic mike and bua, all cables, \$875,
William Fairchild, K5UZQ, 910 S. Shepherd Drive, Rouston 19
Texas.

COLLINS revr 75A-4, spkr and manual. In exc. condx. \$600. Kenneth Engstrom, W5CUM, 833 Oak Forest Dr., Dallas 32,

SFLL Globe King 500, in exc. condx, \$325.00, K2KBU, 168-18 14th Ave., Whitestone, N.Y. Tel. GLemmore 6-6300, FOR Sale: Hammarlund HQ-120, VTVM, Webcor tape-recorder, Dumont 208 oscilloscope, Contax single lens reflex camera, VFO with 813 final transmitter. Write for picture and list, T. F. Waers, 143 W. Glojin Ave., Norfolk 3, Va. FOR Sale; 32V2, \$210; LM13 with calibration, Instrux manual, \$48, W2HAE, Art Ford, 85 Franklin St., Northport, L.I., N.Y. Tel. ANdrew 1-8474, N. Grant St. Sale; Sale

KWS-1. This fine rig guaranteed to have seen very limited use (60 80 hrs), its returned from factory for alignment, etc. Absolute perfect, \$995, \$7y, cannot ship, 1960 factory-wired Johnson ranger, \$225.00; NC-300, \$195; B&W 73 ohm Matchaster, \$19, \$ct of 8 brand new 20 meter traps, specially made ship of the perfect of

Sommertett, K2GXI, 120 Yorktown, Burfalo 26, N.Y. WANT QSTS 1915 through 1922, Sell extras 1923 on up. TMC GSB-1, new condx, \$80. Eddystone 888A rcvr, new, \$400. W2DYU, 36 New Lawn Ave, Kearny, N.J. HQ129X, \$100: 7620 CT 110/220 volt 400 Ma transformer, 191; 110 volt 30 amp. Variac, new, \$36.00: 50 mfd, at 3000 volt condenser, new, \$19.00: Transcon TNS, \$10.00: PS2V push-to-condenser, new, \$19.00: Transcon TNS, \$10.00: PS2V push-to-condenser, new, \$19.00: Transcon TNS, \$10.00: PS2V push-to-volt 100 amp. alternator, \$35.00. Sell or trade for 'scope and signal generators. William Baxter, 3702 No. First Ave., Tucson, Altz.

COLLINS 32V3, 75A3 with matched spkr. Bandmaster Z match.

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CURED Of the radio bug! This rig makes it too easy. KWS-1, \$975. 75A-4. \$525. Robert Scott. W3DKM, Uniontown Rd., Westminster. Md.

TRADE BC1031-C Pandramic Adaptor. D-104 mike with Gstand for citizens band rig: garden tiller. compost shredder or grinder. Trade HQ-170C for Drake 2 or 2-B. I am on move and need small revr. John Bagwell, W5ZYR/4, Somerville, Tenn. 302 W. High.

GREAT Deal!! DX-40. wired by a professional w/key and 2 xtals. Plus ATR switch which mutes revr. 2 keys, VFO, 3 switches ant. Only kit. Price S65. K4NDX. 1347 Avalon. Mont-somery. Ala.

RECEIVER. df. 100 through broadcast, RCA DP12, \$20. Mc-Kenzie. W2SOU.

Kenzie, W2SOU.

SELL: G28 Communicator, rscd less than 1 month, in exc. condv: \$175; Globe 755 VFO, factory-wired, perfect, \$35.00. Dan Munro. 2835 Forest, Ashland, Ky.

SFLL: 4-1000A, air system socket, filament transformer, and blower, also variable vacuum condenser and kilowatt olate transformer, All bought new, no surplus, R. Yeager, 1455 Wilson, Chicago 40, Ill.

SELL: 2-meter Communicator II. \$150: Gonset Commander II with VFO. 180-6 meters: \$70: matched pair BC-611 walkie-talkie w'batt. in exc. condx. freq. 3885; \$90: Fico. HF-85K stereo preamp., \$45,00. Richard Eckhouse, W9EGY/2, 705 E. Seneca. Ithaca. N.Y.

Scheea, Inaca, N. J.
FOR Sale: Globe LA-1, linear amplifier, \$69: Globe Scout 680 with Drake low-pass filter, \$70: Globe 755 VFO, \$30.00: Globe PA-1 power attenuator, \$8.00. Eugene Triebold, KØMBO, Cooperstown, No. Dakota.

SURPLUS Westinghouse transmitter, good for cool Kilowatt. See page 156 July QST. Price reduced to \$200, W2IWV.

LEECE-Neville alternator, latest type with silicon rectifiers, 40 amps mounting and regulator, \$50. W2KDC.

HAM Service: factory authorized Hallicrafters, Hammarlund, Gonset, National, Special: ceramic 4X250B's, new, late surplus, \$20.00 postpaid U.S. Quinn Electronics, 6605 Mardel, St. Louis, Mo.

FOR Sale: BC-348 with built-in AC power supply. \$50.00. W5NW, Box 586, Odessa, Texas.

LICENSE Renewal Reminder service. Biggest bargain in ama-teur history. Automatically brings you renewal reminder sixty days before expiration. Attach 25 cents to OSL Card, print date license expires. address envelope to Automative Reminder Serv-ice. Box 1461. Evanston. Illinois.

10 Amp. 24V rectifier, \$5.00: 110V selsyns, \$3.00: 500W isolation transformer, \$7.00: 5A Variac, \$5.00: telephone relays, 25¢: \$X-28, \$60. B. J. Kucera, 10615 So. Highland Ave., Cleveland 25, Ohio.

SELL: 2 meter Gonset Communicator II: 2 meter 8-el. Teirex beam: AR-22 rotor; JT-30 crystal mike: 70 ft. RG-8 coax; 80 ft. rotor cable: 2 meter halo. All in exclnt condx. Will dem-onstrate. Entire station \$210. Richard Duberstein, 114 Reeve Rd., Rockville Centre, Ll. N.Y.

COLLINS 300G 250-watt broadcast transmitter on 1490 Kc, exclnt condx, \$1250. F.o.b. Marietta, Ohlo. Clark Communications Service. Marietta. Ohlo.

DX-20, \$25; Knight 50 watt and two SW-54s, \$30 each; Heath VFO, \$15; O-Multiplier, \$5.00; gud equipment. Will reply all queries. Flansburg, ETA School, Treasure Island, Calif.

SELLING For school: factory Globe Chief, screen modulator, S-38D, VF-1 with supply, bug, mike, KW lo-pass, hi-pass, \$110. K7BBU, 1018 Cota, Shelton, Washington.

WANTED: To trade Ampro 16 mm. Premier 20 sound projector, carrying case, spkr. combination baffle. 50 ft. cord. Plugs complete, used very little. Cox \$53.0.0 with Fl 2\* lens. For NC-303 revr. Johnson 500, or equal value. What have you? WSCDI, P.O. Box 417, Jonesville, La.

6 Kc. mechanical filter F455J-60 for 75A-4 wanted. K1JPR. CLEANING: B&W TR switch, \$7.00; 400-watt plate mod. xmttr, \$95; old wire-recorder radio. \$15.00; 810s, 813s, Meissner VFO, \$18; power supplies, ground-plane Tribander, \$8, Roller inductor, etc. K2KGU, MO 6-8513,

FB DX-20, \$20, K7LSU, Box 748, Benson, Ariz.

SALE: KWS-1 Serial 2262, modified, new 4X250B 75A4, serial 25700. Excellent condx. Buth \$1400. KWM-1, serial 714 with blinker, AC and DC power supplies, mobile rack and cable. \$700. F.o.b. W3DAE, 3603 Schoolhouse Lane, Harrisburg. Penna. Phono 711-K1 5-8673.

500 W c.w. 150 'phone, 813 HANDBOOK xmtr. complete. \$225; TCK-4 xmtr (2 813s in final) only \$225.00 w/o pwr. supply: Hammarlund Super Pro. \$90: 10-20 converter, 20 M. beam w/8 ft. tower. GD-1, etc. Must sell for college. Tyler KGGF1, 1564 Fulham Kt. St. Paul. Minn. Tel. Mil-42992.

AWARD-Seekers: International Reply—Pald OSLs really get results! 75 for \$1.00, postpaid. Hart, 467 Park, Birmingham, Michigan.

results! 75 for \$1.00, postpaid. Hart, 467 Park, Birmingham, Michigan.

SELL: Mosley 3-element 20-Meter beam, \$30.00: Morrow MB5 mobile converter, \$35.00: Shure carbon mobile mike Model 505K, \$10: NRI Radio & TV Service course, \$20.00. John Neustral States of the Stat

NOTICE! Wish to contact K8AOY. Write information to Douglas Fuhr, Box 721, Holland, Michigan.

138 Funt, Box 721, Hotland, Michigan, GENERAL Electronics factory-wired model "B" slicer wanted or person who had same at Hamfesters Picnic, Write W9QLZ, George Keith, RFD 1, Oglesby, III.
CHANGE Xtal frequency, etch, safe method; everything needed: ammonium bi-floride, containers, holder, instructions, Guaranteed, \$1,00 postpaid, Ham Kits, Box 175, Cranford, N.J.

500 Watt trans wid pwr supply and cathode modulator, new 813 and pwr. supply tubes, \$200. C. W. Eichelberger, 1815 Nott, Schenectady, N.Y.

SALE: DX-40 with mic., \$59; SX-96, very clean, \$150. Roy Welter, KØCNI, RFD 2, Olivia, Minn.

HAMS: Enjoy an inexpensive vacation at Montego Bay's Tourist Resort. For details write VP5BF, Box 192. Montego Bay, Ja-maica. W.I.

SELL: SX-42, S53A. both excellent. Best offer or add cash for late 75S-1 or 75A4. WØNCG, 26 Gimlin Place, St. Louis 38. Mo. HALLICRAFTERS SX-101A receiver. In perf. condx. \$295.00. Going to college. Phil, K9OYB, 306 N. Seminole, Ft. Wayne, Ind.

FOR Sale: HT-32. \$435; Johnson Matchbox, \$35.00; SWR bridge, \$12.00 or all for \$475. Exceptional condition. W. W. Hardwick. W2VXH. 23 Richelleu Rd., Scarsdale, N.Y.

CLEANING, good condition, R46B Hallicrafters spkr, \$9.00: Eico 320 signal generator, \$17.00: Ameco 2-meter preamp., \$9.00: Simpson 0-5DC milliameter, \$8.00: Zenith shortway portable, \$65: JT-30 with stand, \$8.00: 42 ft, tower and heavy pipe sections, \$18.00. Will ship, Gil Kellersman, Stony Brook Road, Darlen, Conn.

Road, Darien, Conn.

WANTED: Heath S.B.10. HQ-180. Super Pro to 40 Mcs.; Gonset
2 meter Communicator. W2CE.

MINT Condition 755-1. 325-1. 312B4. 30S-1 serial numbers in
11.000: \$2100. KWS-1. serial 1290, \$1000.00. Want: 75A4. W2BBV. 49 Frum Ave. Yonkers. N.Y.

R-100. almost new, \$80: Viking I, very clean. \$752. Viking VFO.
\$25. Fo.D. Pacific Palisades, Calif. WA6RFT, Bob, \$57 Almar

Ave. A-1 reconditioned equipment. On approval, Trades, Terms, Halicratters S-85 \$79,00, \$X-100 \$199,00, \$X-111 \$199,00, HT-32, HT-37: Hammarlund H9-100 \$129,00, HQ-129 \$129,00, HO-150 \$199,00. HQ-160 \$199,00, HQ-160 \$259,00, HQ-160 \$259,00, HQ-160 \$259,00, HQ-160 \$259,00, NC-181) \$199,00 HQ-170 \$259,00, NC-181,00 \$199,00, HRO-6 \$345,00, NC-60, NC-173, NC-300; Central 20, \$149,00, HRO-6 \$345,00, NC-60, NC-173, NC-300; Central 20, \$149,00, KWS-1, KWM-2, Elmac Globe, Gonset, Heath, Johnson, RME, Cother Items, List free, Hendy Radio Company, Butler, Missouri

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SELL: Trade: National HFS revr. (27-250 Mc.) with Nat. 5886 power supply and manual; Nat. NC-108-RB (86-110 Mc) with manual. FM. Has tuning meter on panel. Want: High grade Geiger counter. Transistor radio. Describe. L. G. Barrett, 31 S. Park. Hanover, N.H.

# FOR SALE: MEMBERSCRIPTIONS!

No, it's not a piece of ham gear, but every ham should have one. Nearly all active hams do, and even some nonhams have at least one in the family. It's not edible but it does give you something to chew on. Part of it is intangible, the other part is black and white, but should be read.

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he fellow who already has a memberscription well knows that his investment helps support an organization that represents his hobby at all internetional radio conferences, in the Congress, and before domestic regulatory agencies, an organization that publishes over a dozen books and booklets to help the beginner get started and the licensed ham advance himself, an organization that sponsors conventions, contests, and awards such as DXCC, WAS, and the RCC, and an organization that is completely governed and run "By and For the Ama-

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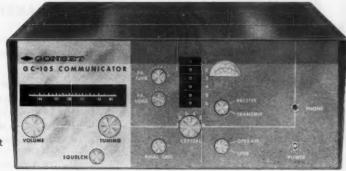


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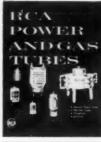
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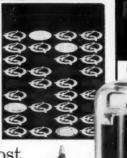














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